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PSYCHOLOGY AND PHILOSOPHY.

I.—WHAT DO WE MEAN BY THE INTENSITY OF PSYCHICAL STATES?

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IN this paper I have no special conclusion to advocate, nor, so far as practice goes, do I know what conclusion it suggests. I have found the intensity of psychical states a most ambiguous term, and I have seen no discussion of its sense which has satisfied my mind. And my aim in these pages is to endeavour to reopen the subject. I will attempt first to remove what seem to myself to be some errors and prejudices, and I will then go on to enquire into the meaning of psychical strength.

We may begin with the question whether psychical states are at all comparable in quantity. This has been denied, and psychical states, it has been said, are by their essence not measurable. It is not merely that in practice *we* cannot measure them, it is not merely that we cannot find and state their amounts in common units, but the contention is that in principle they have not degree and in principle do not admit of comparison in quantity. Now this denial to my mind seems based on confusion, and I will try to show that it is not tenable.

It seems evident generally that everything which exists has a quantitative side, but I am not going here to do more than notice this in passing. And the admitted fact that, rightly or wrongly, we do ascribe degree to psychical states, and speak of one toothache and one flash of light as felt to be more than another, I will at present also pass by. But I will meet the denial that mental states are in principle measurable by

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the question, If so, then what is measurable? If, that is, you cannot compare anything psychical in quantity, is there anything left which could possibly be compared at all? And when this question is faced it surely admits of but one answer. Either you compare what is not psychical, and such a process seems meaningless, or else the psychical must *somehow* admit degrees in quantity. But, if so, the point to be discussed is merely the "how".

And this possibly may be all that was meant by the denial of quantity. Our perceptions are psychical states and, whatever else outer things are, we seem to know them only by and in our perceptions. But certain aspects of the perceived both persist and recur and have a special nature. Time and space, in other words, are content of a sort which admits of measurement in quantity, though the perceptions themselves as wholes (it is urged) are not measurable. For, when we measure, it is not the perceptions which are compared but only their aspects, and only the aspects of space and also of time[1]. Yes, I reply, but, if this is all you meant, the ground has been changed. For you first denied wholly that psychical states are comparable in quantity. But you now agree that they may possess aspects which are so compared, and all that you deny is that *otherwise and in other respects* they can have comparable quantity. And with this clearly you have deserted your abstract principle. Clearly you have allowed that psychical states may in principle be measured, and your addition "but only some states and merely in one respect and not in any other", whether it is true or false, is merely an affair of detail. The principle at all events has been abandoned.

Then do you admit, I may be asked, that psychical states *as wholes* are not commensurable? But *as wholes*, I would reply, are they comparable at all? Or rather let us attempt to find out what we mean. In order to compare things—no matter whether they are psychical or not—you must compare them in some respect or not compare them at all. That seems obvious, and there is something else perhaps not less evident. Things cannot be compared at all unless they are more or less definite, unless they are taken, that is, as circumscribed groups of content. But, if so, they must be abstracted and to some

[1] While agreeing that space in the end is required for accurate measurement, I would point out a feature in time which has been sometimes overlooked. It seems possible, at least theoretically, apart from space, to compare two durations which coexist and start together, but which may differ because one goes on when the other has ceased (cf. Bosanquet, *Logic*, i. 178). This remark has however, so far as I am aware, no practical bearing.

extent *not* treated as wholes. If I am to compare two objects, let us say two stones, the stones first must be objects. But this means that they are content more or less abstracted from its sensuous setting. It means that the vague totality of the "this-now" is ideally mutilated, and that the "given" is emphatically not taken as a whole. And, if you object to this, of course all comparison is precluded. Then having so got your objects, in order to compare them, you must abstract once more. You must consider them from an identical part of their content neglecting the rest. And, if you will not do this, all comparison and measurement is impossible. Your cloth and yard-stick, for example, as wholes are incommensurable.

These remarks seem evident, and let us see how they bear on psychical states. Plainly here we want to know first what "a psychical state" means. If without abstraction it is to stand for a total "this-mine", then of course, all comparison being excluded, such a sensuous given is incomparable, and we must be careful how we venture even to call it a "psychical state". But, if you are willing to distinguish and to abstract, psychical states are at once comparable. We may regard, for instance, my whole condition viewed at two different times. Here by an abstraction we have taken two groups of content, and these groups, the same in some respect or respects, will differ in others. They may thus be compared, and, so far as abstract principle is concerned, their quantity may serve as a point of comparison. For their quantity may be one of the respects in which these groups are the same and different.

Thus psychical states, if they mean the varying conditions of my whole self, may at least in principle be compared and compared in amount. But the term "psychical state" can have a different meaning. Everything that in any sense however ideal is present in my experience may loosely be called my psychical state. For every ideal object must also have its side of psychical existence, and that distinction of content in which it consists must happen in me. I see the rose and smell its perfume, and all this content and all its synthesis is thus a fact of mine. Every element and feature in this ideal whole must modify my being, and therefore from this side it can be called my state. But I am not the rose nor am I odorous nor do I bloom. Such syntheses in their proper character and in their own internal distinctions, while you rest on these, are not my adjectives. They form part of my psychical facts only so far as you do not stand on their abstracted meaning, only so far as you do not take that except in one with its aspect of psychical event, its bearing on me. And however we formulate this distinction of existence and content, and on whatever

principle in the end we take it to rest, to neglect it is everywhere to fall into confusion[1].

"One rose measured with another may be double in size, but their two perceptions, as my states, are not comparable in quantity, and therefore psychical states are incommensurable". But in this objection psychical existence and content are confused. For the content of my perceptions is measurable, and (as we saw above) no one could otherwise measure any object. And again my two perceptions, as two additions to my present psychical being, can obviously more or less increase that in amount; and in principle therefore they each must have a quantity. And if all you mean is that the quantity perceived in and by the two ideal contents is not the same quantity which is given in the two psychical facts, that hardly proves that this second quantity is nothing and nonsense. But if again you mean that two psychical states, as two mere sensuous wholes, cannot be compared in amount, that remark surely is irrelevant. For everything taken merely as it is given is of course in a sense unique, and, as we have seen, it is then incomparable even in quality.

"But psychical states after all are not contained the one in the other, and therefore no relation of quantity is possible". But here once again there seems to be some confusion. Is a yard-stick contained in a roll of cloth? Are two donkeys contained in a horse, or so many horses in a steam-engine? Is a measure in every sense "contained" in what it measures, or are not such questions misleading? Surely in measurement one does not ask whether one given fact takes in another fact bodily. One asks, since two things have a certain same aspect, how in regard to that aspect they are related. And if the objection asserts that two perceptions, say of a foot and of a yard, are in respect of their content not identical so that the second contains the first—that is to maintain that no measurement anywhere exists. But if it is meant that these two perceptions, as two psychical facts, do not add to my existence, and that my existence is incapable of more and of less—that once more surely would be preposterous. And hence from both these separate aspects it seems quite clear that my perceptions have quantity. And to urge that these two respects are two, and not the same, would be irrelevant. They are not the same, but for all that they both are present, and on their connection I shall have something to say hereafter. In the same way we might also speak of the relative breadths or thicknesses

[1] While insisting on the vital importance of this distinction, I should perhaps long ago have warned the reader that it should not be credited to me.

of a yard-stick and a yard of cloth, or of their relative degrees of weight or tenacity, or odorousness or brightness. And what should we reply to an argument that, because their smells did not contain the same linear units, the smells therefore were not contained the one in the other, and could therefore have no degrees of odorousness at all? Should we not answer, Certainly I do not yet know how to measure these degrees, but you certainly have given me no cause to doubt their existence? Two perceptions of space in respect of that one common content, we agree, are measurable. Does it follow that these perceptions can be quantitatively compared in no other respect at all? Even if that conclusion is true it is true merely as a matter of fact, and it cannot be deduced from any abstract principle.

"But no", I may be told, "for extensive quantities are in principle all that is measurable, while psychical states by their essence are (some or all) merely intensive. And the intensive is either not comparable in quantity at all, or is so only by concomitance with another scale the distinctions of which are not qualitative". The whole of this objection, so far at least as it makes any appeal to principle, seems to rest upon error and false assumption. It ignores apparently or forgets doctrines which when recalled remove its basis. For there is really no such thing as quantity *merely* extensive, or as quantitative differences without quality. Because anything is qualitative, that is no reason why it should not also have quantity. And to speak of a scale of degrees which do not in any sense rest upon units, seems utterly unmeaning.

A perception of quantity involves not merely a diversity of units but a diversity which also is taken as a single integer. At least otherwise the whole meaning of quantity seems vanished. But this integral aspect must surely imply a quality. A three or four of anything, though not counted, may be a distinguishable plural whole, and, when these wholes are counted, still as wholes of units they possess each a quality. And without this qualitative side it appears impossible to see how or why we should ever have begun to count or measure. For if uncounted totals did not feel different in a certain way, and if this way did not give the feeling of more and less, I cannot imagine how a distinction and summation of units could ever have happened. Quantities are perceived first, I presume, not as being quantities at all, but as differing merely in quality. They are perceived next as also more or less of some quality or thing. They are seen next to arise and to consist in the addition of units, and to have a qualitative side which varies as these units are more and less. The commonest experience

shows us, I imagine, that groups of units feel different as wholes, and that, without counting, such felt differences are every day used in estimating quantity. And to speak of quantities as being barely extensive without any intensive aspect, and to talk of numbers as being merely discrete and not also continuous, is surely to set one-sided and false abstractions in the place of facts[1].

And what in the end are qualitative states that possess no quantity? Certainly at a low level one can perceive things as being merely Yes or No, or simply again as being "this" or "so" and as being not "that" or "thus"; but, as soon as one has advanced as far as any perception of degree, one has plainly at once both quality and quantity. So that either you must contend that no psychical states have in any sense degree—and that is to set yourself vainly against fact—or you must allow that in principle psychical states can have a quantitative aspect. For that degree means quantity becomes obvious as soon as we reflect. Wherever things are arranged in a scale so that you speak of them in that respect as being more and less, these things so far are quantitative. There is an identical element in these things, and there are diverse amounts of that element. This is what we mean if we mean anything at all by degree, and if we have no such meaning how and why do we come to speak of degree at all? In brief, the attempt to evade this conclusion must lead either to the denial of degree, or to the meaningless assertion of degrees which are not degrees of anything. Nor by bringing in the word "direction" do we succeed in avoiding this result. Certainly we have qualitative ends which we more or less approach or recede from, but we have here still an identity and difference in quantity. For if the end is a state, more or less of which we already are or possess, the conclusion is evident. And the conclusion is still certain even if the end itself has, as such, no degree. For the road towards that end or away from it contains more and less of some element, and degree consists in the varying amount of this element between our position and the end. The top of the mountain or an extreme right or left may be taken as in themselves without degree; but the road by which we reach them, a road which in some sense belongs to their being, shows units and units. And in a blended colour or taste the actual quality of the ends is already present less and more throughout the scale. In short, gradual movement in a certain direction has no sense without identity and quantity. And to take the quantity of the states as the distance "between" them would

[1] I naturally am not pretending here to deal properly with the relations of quality and quantity.

give us no help. For a scale of relative distances of course itself implies a more and less of the same something within these distances. And the qualification of the states themselves by the distances (for in fact they are so qualified), adds one difficulty the more to our unsolved problem. But if a serial perception of degrees is to be "simple" one wonders first what simple means. For if the phrase denies *separability* of aspects, that denial is merely irrelevant, while if it denies their *diversity* it is merely false. And if a perceived series of degrees is not to possess both identity and diversity, by what miracle we take it as a series our phrase does not explain.

But where there is quantity, it will be objected, there must be units many or few. In psychical states on the other hand the units cannot be given, and quantity therefore is not predicable. But, I reply first, there are no units anywhere if not in psychical states. And hence the objection can apply solely to some psychical states, or again to psychical states viewed as such or merely as my adjectives. Now these states, we may admit at once, cannot truly be called measurable, if measurement implies the statement of so many identical units. Such units exist, we may be sure, but we are not able in fact to discriminate and fix them. On the other hand their discrimination is not required for the perception of quantity, nor is it wanted for measurement, if that term is used in the widest sense. For I can tell that this sheep is larger than that sheep and a third sheep larger than the first, though I cannot say that their amounts differ as say 17, 15, and 18. And water is known by my hand to be hotter or colder, though I must fetch the thermometer to tell you how much. Yet without scales or a thermometer my perceptions have degree, and in a sense they are measurable though not precisely. For wherever I can say "more" what I really must say is "This—and" or "This and this—and"; and clearly here we have a difference in which I find the same again together with something else the same. And, if so, I must use at least my first object as an unit[1]. I am taking two things together and I find that the second is the first and also something else the same. And when I go on to consider the internal volume and plurality of both my objects, other units are employed. For I perceive that each thing repeats more or less the self-same element. And because I cannot analyse so as to make explicit any ultimate units, you cannot conclude that such underlying units are absent. Such an argument indeed would end in absurdity. It leads to the scale of perceived degrees which are

[1] Cf. here Mr Bosanquet's *Knowledge and Reality*, pp. 88—89.

degrees of nothing, and to the similars which in no respect whatever are the same, and to the numerically distinct which in no way whatever is different. And it rests on the superstition that there can be no feature or aspect of things unless we can abstract this and, so to speak, when called on, produce it by itself. But we know that things are the same or different before by comparison we have found where they are identical or differ, and if our comparison fails to find this, our knowledge none the less may remain. And where psychical states are arranged in special scales we must admit units of each scale, though certainly we may be unable to produce them. And since psychical states, where disparate, can still be perceived as diverse in quantity, we must in the end assume units of psychical extent in general. We have at least so far found no argument to show that such units are impossible.

And the attempt to find a scale which is not qualitative at all is in principle irrational. For (*a*) in the first place no units can be distinct unless they differ, and this difference implies in the end a diverse quality. The "before" and the "after" in succession, for instance, are not reversible, and this difference certainly colours the successive units. And in space diversity is not thinkable as a fact apart from "right" and "left" and "over" and "under", and these differences, essential to distinct units, are surely qualitative. So that varying extents of muscular sensation apart from local qualities, except as an abstraction, appear to be meaningless[1]. And (*b*) in the second

[1] In the text I am referring to Münsterberg's doctrine, *Beiträge*, Heft III. He speaks occasionally as if muscular quantities were more and less only through different durations. But it seems clear that this is not meant, and that for the purpose in hand such a difference would not suffice. For with two sensations I should have to wait till one had ceased in order to know which is the stronger. It would, I presume, be impossible to have muscle-sensations of the same duration but differing in strength, and this, so far as I know, would be contrary to fact. So that extent (as Münsterberg seems occasionally to state) has to be considered as well as mere prolongation. But with extent must come in local differences in quality. Further, the connection of certain muscle-sensations with certain groups of other sensations seems not treated with clearness. They are connected in such a way that amongst contemporaneous groups the more and less of one feature is perceived without confusion as more and less of the other. And whether the links of these connections are physical merely or psychical also, seems a question to be raised and answered. But I am not undertaking or venturing to criticize a view which I may not have understood, and I will not even suggest that in its main result—if what that result implies were recognized and the doctrine were modified accordingly—this view is untenable or worse than unproved. A perception of more and less might everywhere, I presume, depend in some sense upon muscle-feeling. But wholly unproved on its negative side the view apparently is. For, in order to exclude all units save those of one sort,

place such total extents (as we saw above) have a qualitative side. Each is a whole which has degree and an intensive character. And the ability to count units and to measure, far from removing this feature, implies it throughout as a corresponding and integral aspect. And from another point of view muscular wholes themselves are not commensurable. For every such whole as a concrete psychical state has a particular quality. And such qualities in themselves are not comparable in quantity, nor indeed if you take each as a mere "this" are they comparable at all. In short the objections to the measurement of psychical states apply in principle also to the measurement of muscular sensations. These objections, however, we have so far seen, are founded on confusion.

But I must enter further into a point which I have noticed already. Some perceived wholes, we are informed, are mere multiples of their units, while other wholes are in no sense multiples or contain units at all. Both the assertion and the denial, I answer once more, if so stated, are mistaken. No whole even in space or time is just nothing but its units, or would be a whole at all, if, as a whole, it did not possess a quality. And on the other side, because a whole cannot be regarded as a mere sum, from this you cannot argue that it owns no quantitative aspect, does not contain any units or have any numerical value. It is not true that a difference in kind entails the absence of every corresponding difference in degree, or that this latter difference is not in principle measurable. Indeed to take for granted that no degrees are possible unless in fact we can measure them, and are able to show and specify the units involved, seems, I venture to repeat, quite arbitrary and indefensible.

On the other hand these objections enforce an important truth which we are bound to recognize. The relation between the units and the whole is in different cases extremely different, and a question is opened here with which I cannot pretend to deal satisfactorily. That the units should not differ at all in quality seems in principle to be irrational, and that the mere units *make* the whole seems in every possible case to be false.

surely it cannot possibly be enough to select and cover one part of the ground. All that I would remark on the experiments otherwise is this, that in going from one ratio to another it is not evident that the passage need be direct. For since diverse quantities and ratios have each a general character which can be learnt by experience, it seems possible that such a general impression might unconsciously serve as the intermediary. But I am very far from asserting this to have been the case. I must end with an apology for offering the remarks of one who is scarcely at all acquainted with experimental psychology in general, or specially with the controversial discussion of this point.

But the characters of various wholes must be taken as connected with their quantitative aspect in various ways and in varying degrees of directness and intimacy. Every whole has a quantity, but except in certain spheres that quantity is not its true expression. From that quantity you could never recover the quality of the whole, you cannot see *how* its character demands a certain quantity, or show how it arises from the conjunction of any units. It is otherwise with space and time, for, if we consider any portion of space, we may view this as resulting from the synthesis of certain parts. These parts, lying outside each other, can still be recognized unchanged in the whole, and as units they can be identified with other units falling outside this whole. As separated and combined in various ways these units differ, yet in one respect they all remain identical. Thus all parts of space can be regarded as integers, which each possess a quality, and yet come from and are the various multiples of identical units. And hence for us they are commensurable, and we may conclude further that only such wholes as these, if taken in and for themselves, are measurable in fact. This conclusion I think true, and I am in no way endeavouring to dissent from it. I agree that it is only where the parts lie perceptibly outside each other that the whole is able, in itself, in a proper sense to be measured.

But it is another thing to conclude that everywhere else there cannot be quantity or any units or degree, and that measurement is in principle meaningless. The perception of more or less did not begin with numeration. And where a scale, say of blueness, is observed, though the units cannot be separated and shown, it seems impossible either to deny here the presence of degree or to show that it consists in the external synthesis of spatial units. And as there were units of space before by analysis we had found them, so, I presume, there may be units elsewhere which we by no analysis can distinguish. Units may be combined in manners, I suppose, which more or less we cannot follow, and they may be connected more or less unintelligibly for us with the qualitative character of their totals. We cannot in brief deny that wholes may possess necessary numerical ratios, even when we are able neither to identify and count their units, nor to show *how* causally the quality of such wholes is connected with their quantity. Hence though it is true that only spatial (or temporal) wholes "contain" perceptibly their components, and that therefore only the spatial aspect of things can in fact be measured, that does not prove either that psychical units which are not spatial are nothing, or that everywhere else but in space and time more and less have no meaning.

In every perceived series of degrees the second member can be seen to involve the first *plus* something else of the same sort. All psychical states, apparently without exception, stand to one another as greater or less or again as equal amounts of my personal being. All psychical states therefore (it would seem to follow) must contain a certain amount of common units. It is only in spatial and temporal wholes[1] that the components fall asunder and are visible side by side. And, apart from this, measurement in the proper sense seems to be impracticable. But, apart from this, measurement does not appear in principle and in the abstract to be impossible.

Up to the present I have been engaged in the attempt to dispel prejudices which have obscured the subject. There is no such thing as quantity merely extensive, or as intensity without quantity. Degrees not resting on units in the end are meaningless. Quantity without an essential qualitative side, and a qualitative object with no quantity, are not conceivable. These are all abstractions falsely supposed to have individual existence. And it is a superstition to hold that in the soul is nothing except that which can actually be abstracted and ideally sundered. Further, we saw that psychical states can be considered in various ways. And it does not follow, because in one way they are not comparable in quantity, that they cannot in quantity be compared at all. And psychical states viewed in a certain manner we found were not comparable even in quality, and the same result holds also with those outward things which no one doubts are measured. Abstract objections of this kind possess no value, and to meet them by looking for a psychical scale which is quantitative solely, we found was the attempt to combat one superstition by means of another. Further, our inability in fact to measure does not prove the absence of all units. And you cannot argue that, because only what is extended in space or time can be counted, therefore more and less consists solely in degrees of that extension. And all psychical states, we may conclude, if not measurable in fact are at least measurable in principle.

And now, having tried to remove a mass of erroneous preconceptions, we must enter on the definition of psychical strength. I will point out first the essential ambiguity of that term; I will go on to state some of its meanings and will endeavour to explain them; and I will ask in the end what is the relation of strength, as actual amount, to psychical force,

[1] I abstain from raising the doubt whether, and how far, entirely apart from spatial perception temporal wholes would retain their character. That every kind of distinction depends on such a perception is an opinion which seems defensible, though I think it is incorrect.

and what these ideas can be taken in the end to signify. The reader must bear with me if anywhere I dwell on what seems trite and self-evident.

There is nowhere such a thing as absolute strength, but all strength is comparative and relative. Things again are not compared save in a certain respect and through a feature of their content which is the same. And "more" means more of something in which two things are at once identical and different. It is the more and less of this one feature which gives the direction and the scale of degrees, and without this the word "degree" would be simply meaningless.

Now where anything is complex and in its content has various features (and certainly all psychical states are complex), this thing may enter into various scales, and it may therefore possess at once a variety of strengths. And since its features perhaps are more or less indifferent to each other, the thing may thus alter independently its various strengths. And then degree or size, we know, is in a sense external and arbitrary, and a thing, while itself unchanged, may thus acquire an altered quantity. For the thing may enter into a different whole and a diverse scale. Thus in a foot-rule each inch, as regards that whole, would remain of the same size, though the whole rule were lessened itself to an inch or enlarged to a mile. And so the inch is (if you please) of various sizes at once. Hence, from the other side, you cannot by any change alter a thing's quantity if you, at the same time, alter correspondingly its scale; just as, while the thing itself remains unchanged, its quantity by a change of scale can be altered. These trite remarks perhaps will not seem idle when we consider their application. They show that the intensity of a psychical state may possibly be increased by the mere defect of other states. And it is utterly useless perhaps to argue the question whether attention increases intensity, until you have stated the scale which is concerned, and have asked if attention may not possibly alter that too. For the attention which doubled at once both my rule and my object, would for the purpose in hand double nothing at all. One must beware of arguments from which one would be forced to conclude that no relative size could possibly be observed under a microscope.

Let us pass on from this ambiguity to notice another. Are the intensity and the force of psychical states the same or different, and, if they differ, how is one related to the other? Now taking a "state" to mean some limited constituent of consciousness or sentience, we observe that it may seem to prevail or dominate not merely by its own strength. Accompaniments and reactions, intellectual and emotional, and in general the

connection with habits psychical and physical, seem factors here to be considered. And how far the prevalence of a state can be attributed to itself and to its own proper force, and how far such force is identical with mere intensity, becomes at once a problem. But this for the present I must quite disregard. I must provisionally abstract from pleasure and pain and every kind of reaction, and ignore for the present this question of force. I must, that is, at first confine the enquiry to the actual strength of a state when taken by itself. Let us begin then by asking what such strength can mean.

(1) My whole psychical condition at any time may be taken as a limited amount or extent, and some constituent state, say a perception, may be viewed as occupying a certain part of this area. And to this no one, I think, would object save in the interest of some theory. Now by a fiction let us take my whole condition to remain the same in amount, while the perception itself is increased and covers more of this same field of psychical existence. Such relative quantity, or more or less ground possessed by a state, we may call its varying strength. A state is strong in proportion as it is more relatively to the unchanged amount of my being. But that amount is again itself a relative quantity. For a man's mind contains more than does the mind, say, of a mouse or a butterfly, and once more no one apart from prejudice would call this in question. But, if so, we have got the idea of general psychical quantity. We have first of all an amount of myself which is taken as normal, and we have then the minds of other sentient beings compared in quantity with this and viewed as standing towards it throughout in some ratio. So that my perception, regarded as a certain fraction of my normal mind, is expressible also as, and also *is*, some fraction or perhaps some multiple of other minds. We have in other words accepted the principle of psychical units. Everything psychical is related in quantity to everything else psychical, though to specify exactly the relation may be out of our power. Any psychical fact (to put it otherwise) must contain a certain number of normal units. This is the sense of strength in which, if we pleased, we might call it absolute. And this meaning to my mind is but the expression of good sense and of everyday reason.

But psychical strength can be taken also in another and subordinate sense. The constant quantity of my whole condition was but a useful fiction, and my psychical area is obviously in itself a changing integer. My mind is full and then empty, my feelings are dull or acute, and I am active variedly or seem to sink to a mere passive residuum. So that let a perception itself keep up a uniform strength, let it contain

the same amount of any psychical area we take as average or normal, yet to me from time to time it will become less or more. Its sum of psychical units, we may say, remains identical, but since my total state contains a fluctuating number of like units, the relation of the perception to that whole must fluctuate also. Thus the ticking of a clock, forced at one time into the background and with a quantity we neglect, may at another time become the main constituent of our minds. The sensation is more to me and it is more of me because I am less, and my decrease has bestowed upon it a relative intensity. And though the perception's constant quantity independent of my change is an assumption often untrue, yet the presence of two strengths and two scales appears undeniable. My normal area and my fluctuating area are divergent amounts of psychical units, and they naturally give two different measures of strength. And however much in practice these two strengths may influence and even imply one another, it is clear that, to some extent, they are different and also diverge. Hence we have already two scales and two strengths which may vary independently.

Strength has so far been regarded as quantity of psychical existence, psychical existence measured by (*a*) a fixed, or (*b*) by a fluctuating scale. And without pausing to deal with difficulties some of which must engage us later, I will proceed to a different meaning of strength.

(2) When we speak of a sensation or perception or idea as being more or less than another, we often fail to be clear as to the scale we have in mind. But "more of what", "measured by what scale", and "relative to what whole"— if we cannot answer these questions we are speaking to some extent at hazard and blindly. Now two senses of more and less we have noticed already. A perception or idea, viewed as something which has psychical existence, we have seen can be more and less in two different ways. But beside its psychical existence a perception or idea has a reference to an object. And a more or less of some character thus referred may be what we meant when we spoke of the perception's degree. This fresh meaning of strength differs from what we had before, and it once more is able to vary independently. And this meaning itself may be developed in a number of divergent applications. I must endeavour even at some length to make this plain.

A perception or idea, even if you consider that apart from its psychical context and conditions, is never a simple piece of existence. Its character is complex, and of that complex character we use for a certain purpose some feature or features.

I am not attempting here to explain the fact of attribution, but am insisting merely on something implied in that fact. When an object is qualified it is not qualified by that whole state which we call a perception or idea. It is only one or more aspects of that state which become the adjective of our object, and the state itself may hold an indefinite amount of unapplied features. But from this follows at once an important result. The more or less of an idea or of a perception may mean the more or less merely of one aspect employed as an adjective, while, taken as a whole, the perception or idea will not vary in the same ratio. I perceive a foot and I perceive two feet, and in one aspect and character my second perception is the double of my first. It contains, we may say, twice the units *of a particular kind.* But as a mere psychical fact my second perception does not stand in that ratio. It will not on the whole contain a double amount of psychical units, but will be doubled merely with regard to one part of its area. And how that part stands to the rest will depend upon other conditions. The perception of two feet will, to speak in general, occupy more psychical area than the perception of one foot. But you cannot conclude even in general that the second psychical fact is twice the first, or that in any special case it is even greater at all. For you are using scales which are not the same, and which in part may diverge. Your increase or decrease on one scale may therefore with regard to another scale change its ratio, or it may even become indifferent wholly and quite irrelevant, or even actually be inverted.

I take in my mouth a solution with at least two flavours and of a certain temperature. Then at the next moment my perception is changed, and changed in quantity. Its warmth is doubled, or, if you please, its coolness halved. It is twice as sweet, or half as acid, as it was before. And the perception itself—is that double now or now half what it was, or is that question not, rather, ambiguous and absurd? As psychical facts the two perceptions have (we have seen) a relation in quantity, but as to that relation you can here draw no inference from your data. For the constituents of a perception may vary each in its own scale, while the whole perception keeps its quantity or varies independently. A perception certainly is more of a fact so far as it is hotter, though whether it is less of a fact so far as it is cooler seems not quite so plain. So far as it is more acid it has more psychical existence—to that I agree. But how if with more acidity goes less sweetness, and if the variations of temperature, or again of viscidity and of volume, have ratios which are more or less indifferent and independent? Surely then to ask at large about more and less, without

specifying the element and the scale or scales to which one refers, is to put oneself at the mercy of that blind fortune which does not always smile on the blind. The perception of twice anything is *to that extent* twice the perception, but the perception for all that might be decreased to say one half or one tenth. And this is not because mental states have no quantity at all. It is because they have quantity in an indefinite number of senses, and because to some extent these different scales seem independent or may even be related inversely. And where the scales generally correspond the special case is never simple, so that other conditions can affect and may even in the result destroy that correspondence. And if you answer "but this does not apply where the states are simple", I admit this readily. But I pass it by as being itself wholly without application.

These considerations gain force when we pass from perceptions to ideas. I do not mean that with ideas we find any new principle at work, but the distinction between applied content and psychical existence becomes more palpable. All content of course has psychical existence, and more of that content, we have seen, is *so far* more of psychical existence. But in an image the aspect which we consider may form so small a part of the whole image, and that aspect may also in amount be so inversely related to other aspects, that in the end no conclusion can possibly be drawn. I perceive a light and am to imagine it twice as large. But suppose that the perceived light is the noon-day sun. Must I imagine this not only increased in area but also maintaining a character in proportion to its size? And, if I cannot do this, am I prevented from thinking of it as doubled? All that is wanted surely is for a perception to be so taken in one character as in that respect to be identifiable in other contexts. And, if this is done, and if with regard to that character internal consistency is preserved, surely everything else may be taken as freely variable. The intensity of my doubled sun-image in heat and light is wholly irrelevant. Nay its actual area as measured by my perception is irrelevant also. It is the ratio of the imagined sun to an imagined sky with which I have to do, and the absolute size of my scale does not matter. My image must preserve identity with my perception or else I do not think at all, but the identity here does not consist in absolute area or intensity. The quantitative ratio therefore between the perception and its doubled image is here wholly irrelevant and may be unknown.

And when without using concrete imagery we form ideas of our sun, the same conclusion is more glaring. I am to think

rapidly of my perceived object being changed so as to be larger, brighter, redder and hotter, and let us now say not twice but, if you please, ten or a thousand times; or again let each attribute, if you please, vary diversely in increase. What happens here, I suppose, is that I possess the idea of a general or abstract scale of quantity, and that I identify a place or places on this general scale with a feature or features of my perceived sun. And where I think rapidly there seems to result no individual modified image, but a mere putting-together of two or more abstract and sundered characters. We may realize perhaps even more clearly what this means, if we imagine ourselves to think of our perceived sun's total disappearance, and then carefully reflect on what that thought must imply. But, without pausing to consider this, we perhaps may take our conclusion as made good. At the point we have reached psychical intensity can be seen not to be meaningless, but to have acquired an indefinite number of divergent meanings[1].

The result we have so far reached may be briefly resumed. (1) Everything psychical has an intensity first of psychical being. It occupies an area and contains units which are more and less in amount relatively to my passing state, or more and less measured by some fixed scale of psychical existence. And, because my passing state has a quantity which varies, these two psychical intensities partly diverge. (2) But superimposed on and parallel with these two degrees of psychical existence, we have also a variety of scales of special content. In regard to one or more of their features psychical facts are related in amount, and they give us degrees of this or that special quality, such as heat, smell or colour. Now increase of one feature means increase, so far, of psychical existence, but the ratio of increase in special quality has no fixed relation to the increase of psychical existence. Suppose, for instance, my psychical condition now is = 1000 units, and that in this total my perception of colour is = 100. Now suppose one feature of this colour-perception is = 10, what is the intensity of this feature? It is clearly one-tenth or one-hundredth as you measure it by each total. And my present state, we must not forget, is really a fluctuating amount. It contains now, let us say, 1000 standard or normal units, but it may later contain say 1200 or again say 750. Here is a new sense in which also

[1] It should now be evident that I can have an idea of psychical strength, and that I can have that idea either strongly or weakly. The aspect of a certain amount or of a certain place on the psychical scale can be given itself with varying amounts of unemployed detail and so of psychical existence.

my special perception has got intensity, and the reader, if it amuses him, may find the fractions.

Thus more and less on any special scale must mean also more and less of psychical existence, but how much more and less cannot in general be decided. And this truth in an ordinary complex case is quite irrelevant. For gain and loss within the whole psychical fact may balance each other, and the total amount may remain the same while its factors are changed. Thus a perception may in one respect be more and in another respect less, while as a psychical quantity it remains the same. And with the psychical facts called ideas, though no new principle is introduced, the multiplication and involution of divergent scales becomes more glaring. The former meanings of intensity all remain, but other scales and other meanings are superimposed on the ambiguous complex.

But in principle, I would add, this result is not sceptical. It would be sceptical if it showed that there were no scales at all, or that in themselves scales varied unworkably. And how far in practice amounts can be measured I do not enquire. But to insist that quantities all are relative to some scale, that one thing in various ways can be relative to various amounts, that, so long as in any total the internal ratios do not change, other changes may be irrelevant, and that before you ask about degree you should know first what scale is in question—such conclusions seem dictated by ordinary reason. And from another side our result is hostile to scepticism. For all psychical phenomena, it urges, can in principle be measured. They can all in principle be taken first as various amounts of existing psychical content, and then also as special amounts on diverse scales of content variously specialized. And everything psychical in the end must be taken as in principle somehow commensurable. This conclusion I will proceed to defend against several objections.

An objection may be urged first against the idea of measurable psychical existence. Quantity, it may be said, is predicable only of content made the adjective of an object, and psychical existence, whether by excess or defect, cannot possess this character. But the objection would rest on a mistake. The merely "given" taken as such, we saw above, is not comparable, but the merely "given" is not the same as psychical existence. Psychical existence implies the construction of a soul-substantive enduring in time and owning adjectives which through change preserve a basis of identity. Such an arrangement clearly transcends any deliverance of sense, since it involves the construction of a soul-object qualified by content. And of such an object quantity can in principle be predicated. And

to urge that my experience is not throughout perceived and treated as my adjective—that, when I am self-conscious, what I perceive must be less than what I am—would be irrelevant. For everything that I am, though not perceived, is in principle perceptible. In its general character and in the mass it can thus be taken as adjectival content, and can be predicated of the ideal construction which I call my existence. Nor is there anything in me which is unable so to be predicated.

In these enquiries while distinguishing we must not divide. The higher and more specified state of mind does not banish the lower. It is superimposed on, it still implies, and from one aspect it still is at the stage of the unspecified basis. Everything in experience is felt and is given first as a "this-now". Then the content of experience separates itself into groups, a "me" and a world of "not-mes", ideal objects to which all is referred as adjectival. And the same felt content, we must never forget, is used at once to qualify both the self and the not-self. There is first the feeling-green, then the sensation of something-green and of my so perceiving it. But, if these two groups and their adjective and their relation were not felt, they would not be experienced at all. And, from the other side, the feeling which precedes, and which also underlies and contains the distinction of me and not-me, can, when reflected on, be taken as the adjective of either of these objects. The history of my whole experience is an adjective which has its place in universal existence, and is also itself the private existence of my soul. And whatever advance in further distinction and ideal development takes place, the aspects both of feeling and of psychical existence still persist and are essential. But where there is existence, there also we must have more and less. And with these brief remarks I must leave the subject of psychical existence. Objections urged against it may seem subtle but will be found in the end to rest on confusion[1].

I pass from these refined doubts to dwell on the idea of psychical units. I do not contend (I may repeat) that such units can be fixed and used in practice, but in principle their existence must be assumed. Psychical states of every kind can as against one another seem more and less, a toothache, for example, can appear weaker or stronger than an exercise in logic. And if in these different things were nothing in which as amounts they were identical, and more and less of which they possessed, I do not see how they could come as members in one scale. It is here with quantity as it is with quality. If smells or if colours have no common quality, why do I treat each class as if it

[1] The question whether for psychical reaction something more than existing content must be assumed, will be touched on hereafter.

possessed it? And if the quality of all psychical states had no one common feature, how could I feel them as entering into and making up my being? To reply "then show your quality, and show your units bare" is surely irrational, for, by the hypothesis, as bare they do not exist at all. They could be shown only as abstractions, as single features specially noticed in concrete wholes, and how far in each case the abstraction is definite and useable, is of course a further question. I have two greens which are the same in green, I have a green and a red which both are colours, I have a colour and a sound which both are sensations, and I have a colour and a toothache which are both the same as being felt and as being mental states. I have two blue-greens in which the green is more and less, and two greens the same but more and less in brightness or in area, and a colour-sensation fluctuating as more and less against an invading sound, and, when the sound is removed, at once becoming more of me. There are differences specifying a lowest basis of sameness, and then these differences themselves are further specified, and as identities they underlie higher distinctions. And against this essential and all-pervasive evolution to object, "But show me the identity bare, and then I will believe" is surely blind irrelevancy. For a bare identity or difference is just that, which, if the view objected to is true, is *ipso facto* impossible. In other words an identity or a difference is by its essence relative. Thus two perceptions are related first as quantities of general psychical existence, they are related next as fractions of my present condition, they are related next as two perceptions of length, and so on indefinitely. In each respect they contain relative amounts of one common something, and these identities persist whatever more specified identities are superimposed. Thus units of psychical existence, we may admit, cannot be distinguished and fixed, but they seem open for all that to no rational doubt. Let us go on to another point.

There is an instructive, if obscure, discussion by Lotze[1] on the strength of ideas, a discussion which no German writer at least might have been expected to ignore. Into this as a whole I regret that I cannot here enter, but on one point I will comment. Ideas, Lotze seems to tell us, themselves cannot be stronger or weaker. For ideas are not what they mean, and they may signify strength but, it seems, themselves cannot possess it. Now this distinction of existence from meaning I gratefully endorse, but from the conclusion which seems based

[1] *Mik.* i. 229, *Met.* § 262. The meaning and position given to *Erregung* strike me as obscure, nor do I perceive again, how far Lotze realizes that any alteration of anything in degree is, in itself and merely so far, a certain change in quality.

on it I have to dissent. For in the being of an idea I find always psychical matter extraneous to its meaning, and this unemployed content, I must insist, can vary in quantity, while the specific meaning of the idea remains identical. And though one aspect is able to react on the other, they need neither have the same quantity nor preserve the same ratio. In something of the same way in a perception of heat volume and degree may be confused, but for all that each aspect possesses its own proper amount. Now, like every other state, an idea must have its quantity of psychical existence, measured by a normal scale, or measured also by my passing condition. Nay, we have seen above, that, in order to mean more or less, a state must, in that one aspect and merely so far, have more psychical being. And right as it is to say with Lotze, that ideas are not what they mean, it is also true that ideas can mean nothing but that which they are. For unless a thing has, and to that extent is, a quality, I cannot myself understand how it goes about to show it[1]. The idea of the extended has extension[2], the idea of the heavy has weight, the idea of the odorous has smell, and the idea of pleasure, beyond all controversy I should have thought, exists and is so far pleasant. But the specific aspect of the idea, though not destroyed, can be utterly overborne, the truth and the existence of that aspect fall in different worlds, and their intensities, though weighable and not mere shadows, are not weighed merely in one balance.

But, I may be told, you are avoiding the point of the objection. For with ideas we have relational activity, and of this activity there are no degrees. And though the product has degrees, they are not degrees of psychical strength. My desire, I reply, is not to avoid this point, but, if that be possible, to discover in what sense I am to take it. Naturally I cannot enter here into the special nature of the relational consciousness, nor ask with what meaning or what absence of meaning "activity" may be used[3]. But if I am to understand that

[1] The existence of conventional and arbitrary signs, and of mere accredited representatives, forms no valid objection. For, unless the meaning is *somehow* there and belonging to the sign, the sign would be no sign. The question is merely as to *how*, within the whole actual sign, the meaning and the existence are in each case connected—whether, that is, they are connected indirectly and through external association and credit, or directly and through an internal property. But for the purpose of the text this question of *how* the sign possesses the content it signifies, seems quite irrelevant. Here (though not everywhere) the above distinction has no importance.

[2] I hope in a future paper to return to this point.

[3] The doctrine for instance advocated by Brentano, *Psychologie*, pp. 157 foll., as to the relative intensity of Vorstellen and Vorstellung I could neither affirm nor deny. For all I know it may be plainly

relations and distinctions are not psychical facts, I answer respectfully that I find it quite otherwise. But, if they are facts, then at once I presume they have psychical existence. And if you tell me that I can have an idea or perception which contains a relational complex, and that this complex can *ad libitum* be made more complex, while its psychical existence is not thereby increased, and while the whole perception occupies no more room in my mental area—I reply that once more you seem to be in collision with palpable fact[1]. And I am curious to know the principle on which more is to happen *in* me, when it is not to happen *to* me. But if all you mean is that a whole relation is both more than its terms and also is less; if you mean that the terms, taken either without the relation, or taken again not in that aspect in which they are related, have psychical strength, and that *this* strength is irrelevant to the essential content of the relational whole—your conclusion has vanished. For you started with denying that the ideal whole has any psychical strength, and what you now deny of it is merely the psychical strength of, in short, something else. Because the strength of a related complex is not that of its unrelated factors, nor of its factors so far as they possess unrelated aspects—you assert that it possesses no strength at all. And this conclusion, false in principle, in practice collides with facts[2].

In brief, a perceived or thought relational whole must be a psychical state, and whatever other aspects and scales of quantity this perception may develope, it must through all from one side still remain a psychical state. It must be measurable, that is, in the scale of psychical existence. And with this I must pass on to another branch of the enquiry into strength.

Strength has so far been used in an arbitrary sense. I have taken it as equivalent to extent or actual area of psychical being. And a "state of mind" again has been understood arbitrarily,

tautologous or again plainly false. For I at least, until I am told, do not know what an "act" is to mean. And I must be pardoned if from time to time I repeat this, and repeat also that I am not yet ashamed of my ignorance.

[1] I am not here denying all difference between clearness and mere strength. But I am urging that increase of the first must *so far* mean increase of the second.

[2] The same principle is involved in the objection that a stronger idea or perception is a different state, that it has a different content and not the same content to a different degree. Yes, I reply, but if some part of the content is always irrelevant, the idea or perception, increased and so different with regard to that aspect, may in respect of its essential aspect remain the same. And if so, the same idea *will* have different strengths.

for I have treated it as something with an existence clearly circumscribed. But these assumptions have now to be discussed and corrected.

In a particular state of mind, say a sensation, perception or idea, what is the state itself and how much is mere accompaniment or result? Can you exclude the latter element, and, if so, where and how can you draw the line? States are, for instance, painful and pleasant, but what is here the conjunction or connection? Have we adjectives or have we accompaniments or once more mere results, and, if results, to what precisely are the results to be attributed? And a state also has irradiation physical and psychical; it spreads in itself and it spreads in its effects; and whether this spreading is to qualify the state, and, if so, how far, is a question not easily answered. But since "irradiation" is an idea perhaps not wholly clear, let us pass from it to consider what is implied in "reaction". A sensation is qualified by reaction, and how is the reaction provoked? Is it due to the mere strength of the sensation or to its quality or to both? And, when the reaction is there, in what sense does it belong to the sensation? Exclude the case of general shock, and confine your attention to special responses to a special stimulus. There is a "disposition", physical merely or psychical as well, and this latter generally at least, I presume, is acquired and has the form of a mental habit. Now if the sensation (to speak in general) has a quality which corresponds to the habit, a reaction takes place which qualifies the sensation. But what is here the sensation itself, and what are mere results? And beside the "strength" of the sensation has it got an independent "force" to produce such results?

A state, we may reply, only is that which at present it is. And what it may become or what it has become, is, so far, a different state potential or actual. But this answer, it is clear, does not dispose of the problem as to force, and even as regards the individual being of the "state" it offers no solution. For the question was as to the boundaries and limits of this being. So suppose that the state is distinguished from what it causes and becomes, yet even then can you divide it now from what it is not? For any sensation, perception or idea, is surely the product of abstraction. It is a special distinguished content which has also a psychical existence. And the difficulty is here not to distinguish merely the "what" from the "that", but rather to draw a line between the existence and its conditions, between the "that" and the "how". And this ideal partition of an undivided psychical whole is always more or less arbitrary, and it tends more and more, as you descend, to become even impracticable. For if you pass from an idea, and again from a

perceived quality referred to an object, and come down to a sensation which is merely given as a certain something—the "that" and its "how", as you descend, become steadily perplexed. And to separate at the lowest level the existence of this somewhat from its connection with my total state and from its colouring of pleasure or pain becomes in practice impossible. The individuality of a psychical fact is thus always an abstraction, it is always to some extent arbitrary, and it tends in part to become an idea which in practice is inapplicable. But within limits the use of this abstraction seems possible and legitimate.

We are however met by further troubles when we consider the relation of strength to force. For we have taken strength so far to mean extent of psychical area, the occupancy of so much ground or the possession of so many units. And this idea we found clearly to be legitimate and even necessary. But we must beware of misunderstanding, and there are cautions which I must be allowed to repeat. There is no psychical empty space in which psychical states contend. There is merely a common underlying substance or quality which all such states contain and which each further specifies. It is on the basis of this indwelling identity, and it is only by virtue of it, that states are able to struggle at all. And this quality, regarded itself as specified into a plurality and into distinctions of more and less, affords units and degrees of psychical amount. And because our whole psychical condition, taken at an average or at any one time, is a limited quantity—the ground or area occupied by a partial "state", and the units of existence which it usurps, can be thus in principle defined. Whether in practice such units can be shown, and can be used for exact measurement, is a question I pass over. But in any case I repeat and I would insist that the units and the underlying quality are merely abstractions. To regard them as capable of existence barely in their own character, and to demand their production and their exhibition naked, I must consider ridiculous. But I urge on the other side that to deny the existence of an identity when naked agrees perfectly with the assertion of its existence when clothed. Or (if you prefer the metaphor) the soul keeps no stuff not worked up into garments, but because of this to deny the sameness and the more and less of a common stuff would be quite irrational. Or the soul, we may say, can let no building-land wholly unbuilt-on. But such a condition does not exclude its power to afford an indefinite amount of area and for any kind of superstructure.

But if strength is the same as actual extent or amount of units, then strength is a narrower term than force, and it will not cover all the facts. For if a state is strong it should

dominate, it should hold its ground, it should repel and more or less extrude what attacks or even does not attack it. And, without acting thus, it must be ready, when called on, to maintain itself. Its strength in brief seems to be extension not actual only but also potential[1]. And if it maintains itself by an extraneous help, are we to call that its strength? The position of pain and pleasure, we saw above, gives rise to questions. And again a state apparently may dominate by its relation to other existing states, and also by its correspondence with "dispositions" physical and psychical. And it may even be said to dominate not merely through actual support, but by help which is indirect and even conditional. An idea, we may say, is strong when it itself is constantly suggested, and when any opposing elements, as they arise, provoke a reaction which excludes them.

We have therefore to introduce here the idea of potential energy. It is of course mythological, but its employment seems forced upon us. A state which corresponds to "dispositions" has a key which fits the wards, and so this state can unlock energy, which, being unlocked, it then harnesses to its cart, or astride of which it gets and calls this its own strength. It is perhaps well to use metaphors which confess themselves absurd, if we desire wholly to escape from domination by mere metaphor. However every man here must follow his own taste. And some writers prefer to speak of a "functional disposition" as if they knew what that was, when perhaps anyone can see that they have never faced the question. To me a "disposition" is a convenient but clearly a mythological way of stating a general fact or law, a way of psychical happening which I do not pretend to understand. When certain things physical and psychical too have happened already, then, given something else under certain conditions, a certain result will take place[2]. And in the present case this conditional result is the addition of strength, and a psychical state therefore can "have" potentially the energy which, when become actual, it appropriates.

But when this all has been admitted, our difficulty remains. For (*a*) the strength thus produced seems hardly to belong to the state itself, nor (*b*) does the state act as a stimulus by reason of its mere strength. (*a*) If a state has force to set free energy under certain conditions, the issue of this energy, we may admit, in the end is increased psychical area. Thus force is not strength, if strength means actual area or existing quantity, but force is

[1] In what follows we are on ground which is covered by the term "interest". It is in my opinion a mistake to try to limit the use of this term to denote pleasure and pain.

[2] Compare *Mind*, No. 47, p. 363.

so called only because it means potential strength, and because, given the conditions, it passes into amount of psychical units. And all so far seems tenable. But why on the other hand the state is credited with all the strength which conditionally it provokes into being, seems not intelligible. The stimulus may itself be destroyed by that explosion the outcome of which you desire to place to its credit. And if this has a sense, surely in the end that sense is arbitrary and useless. Even where the stimulus survives as an element in that increase it has provoked, even where the conditions are ascertained, and where in the whole result the stimulus is so placed that that whole is regarded as its adjective—even here to credit it beforehand with the incoming amount is an evident liberty. Even here its force will be its credit merely, and not its actual possession of existing units. And otherwise the force of a state is but the fact that conditionally it may act as a stimulus, and so conditionally produce some increase of some psychical extent. But by what right that conditional extent is to be called *its* strength is not apparent at all.

(*b*) Nor even as a stimulus does the state act by virtue of its strength. To act it must indeed possess some strength, a minimal amount that will vary with varying conditions. But its special act is certainly not the effect of this mere general strength. For we take the state to be acting not as a bare shock, but by reason of and through its special quality. And if it has the quality required, the degree of that may within limits be irrelevant. But this quality on the other hand cannot be resolved into amount of psychical units. You cannot say that the state stimulates thus or thus, simply because its strength is so much. You may by a legitimate abstraction consider that strength, that number of psychical units, without regard to any quality. But you cannot derive the qualities and their effects from a mere number of units and show them as its result. And to speak of a special arrangement or grouping of these units would be, so far as I see, to use words without a meaning. We have a general quality, and within that quality we have strengths that vary, and we have special qualities and, within each of these, we have again varying strengths. And the second set of distinctions we regard as superimposed on the first. They specify the underlying substance, and to their specific natures a certain amount of this substance in each case corresponds. But to deduce the qualities from the units of common substance, or to make an equation between these terms, seems out of the question. Given a certain quality you have somehow implied a certain quantity, but, given the same quantity, the same quality is not necessarily implied. And, if so, the force by

which a state maintains or increases its ground, will in the end diverge from the extent of its actual occupancy. And by the use of the term potential we make no real advance in understanding. For the force which potentially is strength, in the sense of occupied area, either cannot be taken as belonging at all to the actual state itself, or belongs to it not as an amount but as a special quality.

If there are any results from this enquiry it is time we gathered them. (1) The force of a mental state is a phrase which is most ambiguous. It seldom, if ever, means the same as its actual quantity or area. (2) Psychical strength, taken as an amount of psychical existence or a number of its units, is a conception valid and perhaps useful. Its scale may be relative to my varying condition, but again is average, normal, or absolute. (3) The units of this scale probably cannot be shown, and certainly cannot exist bare; but as an abstraction we seem forced theoretically to assume them. (4) Everything in the soul which in any sense becomes more or less, has *so far* a more or less of psychical existence, but only *so far*. Every "state" is complex, and the whole state therefore may have a quantity which bears no fixed ratio to any one aspect. (5) Within our psychical content there thus fall scales indefinite in number and more or less independent and able to diverge. Hence a single state may vary quantitatively in various respects, as well as in respect of psychical existence. And to a certain extent these respects may diverge in quantity. But the practical outcome seems merely this, that before we talk of intensity and before we predicate degrees of strength, we should first of all define its kind and the scale we are to employ. Otherwise may come discoveries where no one knows what is discovered, and controversies where in the end no one understands what is in dispute. But others must judge to what extent this reflection has practical bearing. My object in this paper has been to raise some doubts on an interesting question the difficulties of which, it appears to me, are not sufficiently recognized.

II.—ON THE DIFFERENCE OF TIME AND RHYTHM IN MUSIC.

By Dr R. Wallaschek.

If in a psycho-physical laboratory an electric hammer gives a regular succession of equal beats, the attentive observer is able to mentally divide this succession of beats into equal periods of two, three or more beats. While perceiving them he divides them, as the musician would say, into bars; he arranges the beats as if they were given in duple, triple or any time, although the actual beats remain unaltered all the time he observes them. This faculty is called the sense of musical time[1]. The beats always represent the same monotonous rhythmical movement, but the observer's mind may assume different attitudes of observation, may change the time division by altering the length of the periods (bars), or uniting another number of beats into one group. The rhythm is in the object, while the time-division is only the form in which our mind perceives the rhythm, the way in which it arranges, systematizes, unites the sensation of several beats into one whole period, into a time-unity. It must also be noted, that this time-sense of the observer, his ability to arrange regular sensations into periods, to perceive them not as single beats but as groups of beats, is an immediate (intuitive) perception, i.e. the observer does not arrive at this form of group-perception through counting the number of beats which make up one group (bar or period), but he immediately perceives the group as such without the medium of counting. The musician has to feel the time intuitively, and his counting it out is only a substitute for feeling it, whenever the time-perception has got lost. Counting is an association of beats with numbers, time-keeping the ability of immediately perceiving beats or sounds in groups, periods or bars.

[1] The French have a peculiar word for it: 'mesure,' as have the Germans: 'Takt.' The English word 'time' is somewhat ambiguous, and hence perhaps the numerous misconceptions of any theory based upon the Time-sense.

One and the same rhythm may be perceived in different time, one and the same time may contain different rhythms. If we ourselves, not the electric hammer, are the performers of the movement, we should very likely alter the accentuation in accordance with the alteration of the time-division, but this would be only a probable not a necessary coincidence; for in spite of an accentuation which is likely to suggest say triple-time, the observer may still follow duple-time in his thought, to such extent can rhythm and time be kept separate from each other. In one word: rhythm is the form of the objective movement, time-sense (mesure, Takt) the form of the perceiving subjective mind. Time-sense is a faculty corresponding to the power of symmetrical visual perception, which is neither the sensation of sight itself nor the mere sum of all the sensational phænomena, but something in addition to them, i.e. the ability of arranging, dividing, grouping the phænomena into equal sections. So then the time-sense is not a sensation proper as hearing, seeing etc., but a mental work of grouping the sensations, and this takes place not in the senses themselves but in the cortex[1].

If we insist on this merely mental character of time-division in music we shall be able to base on a psychological principle a long existing musical controversy, in which musicians have discussed the question whether a composer is bound by the natural structure of his composition to write it down in a certain time-division (say duple or quadruple time) or whether he is at liberty to fix in writing the length of bars or even the whole time-division according to his individual preference or the practical principle of easy reading. These musicians have asked themselves whether time-division has an outside reality or not, whether it is dictated by the object or by the subject. Mr Lussy, who was in favour of the former view, even went so far as to show that Mendelssohn made a mistake in designating the time of one of his compositions. This very fact, however, seems to me a precise counterproof of Lussy's theory, for if the composer himself can make a "mistake" in this respect the structure of the composition cannot have been subject to any very strict and definite rule. It seems that other writers have agreed on a sort of compromise, and they say that one may always know from the very structure of a composition whether it is in duple or triple time, but liberty is allowed as to the sub-divisions of these two classes as to $\frac{4}{4}$, $\frac{6}{8}$, $\frac{3}{8}$,

[1] Therefore Kant was right in calling time an "Anschauungsform," although wrong in considering it to be "a priori," however this latter term may be interpreted.

$\frac{12}{8}$ etc. None of the writers however thought of referring to the psychological character of the subject and of asking "what is time?" in the musical or in a general psychological sense. Had they done so they would easily have perceived its internal, subjective character. Considering this I should say that the structure of the composition as such does not even tell us whether we have $\frac{2}{4}$ or $\frac{3}{4}$ time before us, e.g. the typical example of $\frac{3}{4}$ time is a waltz, but we can very well perceive it as $\frac{4}{4}$ time without altering the composition in the least if we unite four $\frac{3}{4}$ bars into one $\frac{4}{4}$ bar. An instance of opposite transcription may be noticed in Wagner's Tannhaüser-Ouverture. Its second part is written in $\frac{4}{4}$ time and towards the end the theme of the first part (originally written in $\frac{3}{4}$ time) is again repeated. But this time it is written in $\frac{4}{4}$, and yet the object of the theme is the same. I have also seen eminent conductors beat $\frac{3}{4}$ time to this part, although it is written $\frac{4}{4}$. They unite three $\frac{4}{4}$ bars into one $\frac{3}{4}$ bar. This shows that the character of the composition does not compel the composer to *write* a certain time-division, the form of the latter being simply chosen for the practical purpose of easy reading. If we further consider that every regularly worked out composition has an even number of bars, we may transcribe any composition into one of duple bar, if we only unite a period of several bars into one greater bar, which in consequence of the even number of bars must end in duple time. Therefore it is with time as with symmetry; there are not two kinds of symmetry, a twofold and threefold, there is only one, that is represented by evenness, no matter whether the objects which are to be arranged symmetrically are groups of even or uneven numbers, no matter whether the single bars united to a period consist of even or uneven tone-elements. Perhaps an opponent would say: the symmetry of uneven numbers is the triple time. In this case I should ask him to consider that it is not the number of smallest tone-elements that designates the time-division, but a higher and wider formation of tone-groups whose extension lies within the liberties of our perception. I must also add that I am well aware of examples of $\frac{5}{4}$ and $\frac{7}{8}$ time, which under no circumstances could be perceived as duple time, as e.g. in Tristan and Isolde (3rd Act, when Tristan sees Isolde's ship coming). But in this instance the composer purposely left aside all considerations of regularity in order to illustrate the dramatic restlessness of the scene. In such cases the time-division is not a division proper, but is replaced by voluntarily chosen marks to hold the players in concert.

The evenness of time-groups in music arises from the original organic union of dance and music, so that we may say

it is in the last instance founded on the fact that we possess two legs.

Bearing in mind that musical perception (and with it the essence of the musical mind) consists in the ability of group-perception and that this forms an element of the individual intellect, it will be clear—I think—what I wanted to say when I attributed in my "Primitive Music" the origin of music to the time-sense. I wished to point out the peculiar state of mind necessary to intentionally and consciously produce music as a work of art, to distinguish it from a mere vocal utterance which might be the result of a corporal stimulus of and for the moment. Of course I shall be asked why I insist on this difference and why I do not consider primitive music just as much a reflective utterance as a bird's song. My answer is because I found that the starting point of music, the peculiar germ which has alone been capable of the enormous development actually accomplished in music, is the *chorus*, with its frame-work—the dance. What the bird sings, what a single individual may exclaim in joy, in anger or in pain, is the reflective outcome of the feeling, of which the momentary corporal condition is a stimulus, and for which it is a vent. Here the matter ends, and there is no necessity for variety and development. But if two or several people sing together, then song is something more than *merely* the outcome of feeling, for they have to keep their performance in accordance with each other, and to accomplish this they have to observe, to group, to arrange the tones; they have to assume the same psychological attitude as the observer of the electric hammer who perceives the regular beats in the form of groups, bars. They could not keep together, if they did not mark periods (groups), for there is no concert possible without bars. What they perform is rhythm, what they *think* is 'Takt,' and what they feel is 'surplus of vigour.' The necessity for this form of performance arises from the social character of it; it is the necessity along with the ability for acting in concert; and so I might well call the time-sense and with it music itself "*une faculté d'ensemble.*"

Saying this I must add that I do not wish to revive the old theory of distinct faculties, and that where I use the word faculty it is merely for shortness' sake. The fact of my speaking of group-perception shows that I mean a kind of mental activity not confined to music alone, for a group-perception might be the outcome of any sensation, and need only result in music when it is used to form an expression in tones.

When Aristotle said, *ἄνθρωπος μὲν ζῷον πολιτικόν* he might as well have said *ζῷον μουσικόν*, thus indicating not only his sociability (which he has in common with gregarious

animals), but his ability of acting in regulated concert with others, in unison, in symmetry with them, of making his fellow creatures not only members of a society, but forming all of them into one body, one new organism. A musical ensemble, an orchestra, a chorus, is one organism, one person, just as the state represents (juridically) one person, not only a company of several members. In this sense music may be spoken of as a social function (not to be confounded with society-function).

I might now proceed to a further presentment of my theory by meeting some objections or perhaps misconceptions of my critics. The most frequent remark is to pronounce the time-sense as too complicated and to refer the origin of music to the natural rhythm of our heart-beats. This theory has been before the world since the time of Aristotle. But the reader will now see that I had to resist the temptation to this seemingly natural theory. There is no 'time' in the heart-beats themselves, but only in the mind of the observer, and as in the normal condition we observe the heart very little (if we notice it at all) and the abnormal condition is not the time for observation, we could hardly be led in that way to our idea of time-division, especially as we never feel any *necessity* to observe this mere individual phænomenon in the form of regular bars.

Another view is that of Mr S. Wilks[1], who says that "the rhythmical sense *or* sense of time insisted on...as the basis of music is the same thing as the muscular sense already spoken of by physiologists as forming an intimate part of the musical faculty." I must object to two points in Mr Wilks' criticism, (1) that sense of rhythm and sense of time are identical. I may well perceive and perform a given rhythm, say in a military signal, without having any time-sense. Some street-cries, many birds' songs, cannot be given in musical bars (time, Takt, mesure), and yet they are rhythmical. (2) I refer to the great difference between time-sense and muscular sense. We may have a proper muscular-*sensation* it is true, but, in the term time-sense, the word sense is merely metaphorical, for only the further mental process of arrangement of a given sensation into groups, periods or bars, makes up the time-sense. Mr Wilks so much confounds time and muscular sense as to say: "Beating time is in reality the concentration and relaxation of certain muscles." This may be the physiology of beating but not that of time. The intrinsic character of time, however, is not its being beaten, but its being known, it is not the movement of the conductor's arm, but the form of his intellectual perception of music in which his muscular sense

[1] *Medical Magazine*, London, January, 1894, p. 511.

alone helps him nothing. I admit that in the music of primitive times, owing to its connection with bodily movement, it was the muscular impression as much as the auditory, or even more than the auditory, that gave rise to a time-ordered perception. But I can never admit that the perception and the movement (time and rhythm) are identical.

The attention Mr Wilks calls to the muscular sense is certainly of great importance, and is, so to speak, the physiological form of the ethnological fact that primitive music is firmly associated with bodily movement (dance, gesture and action). But it has to be said further: that the muscular sense is not directly and in itself the cause of enjoyment in music, but becomes the cause not only of enjoyment but of high mental edification when forming the basis of a cortical process which consists in arranging a certain number of sensations in time-periods, and perceiving them as whole united groups. Through this mental process the otherwise mere sensuous enjoyment rises to the higher rank of artistic value, while without it the musical performance would have to be placed on the same level with gymnastics or, as in the savage world, with beating and fighting, and this difference in rank certainly exists even for primitive men. Such considerations lead us to the seemingly paradoxical result that the muscular sense has far more importance in the original development of music than the sense of hearing. This view changes at once the whole attitude of an inquiry into the psychological cause of music. It is not the sense of hearing alone which is to be examined, but when the physiology and psychology of music are in question, the subject for inquiry should be the cortical process. The first stimulus is the muscular sense, and the sense of hearing only comes into action later as an additional help in getting a greater number and superior quality of sensational impressions which through their qualitative difference and greater substantial richness might facilitate the course of the cortical process. "Making music" means in the primitive world performing, not listening. In the most primitive concert an audience does not exist, all being performers. A long time is needed before the sense of hearing can take a part of equal importance with the common action based on the muscular sense, and yet again a long time before it becomes the more and ultimately only important sense. The whole structure of primitive music shows this: an unsettled melody, an uncertain and constantly varying intonation, a perpetual fluctuation of pitch; and contrasting this with the strict and ever prevailing rhythm, with the precision and marvellously exact movements of numberless performers—we see where the chief point lies.

The musician is not necessarily one who hears best but he in whom originally the muscular sensation (later on chiefly the acoustic sensation) most frequently results in cortical processes (of group-perception); the painter need not be he who sees best but one in whom sensations of sight result in the most frequent and intense cortical processes, the sculptor he whose tactile sensations most frequently result in cortical processes etc., etc. But in any case I should lay special stress upon the action of the brain and the peculiar form in which this action manifests itself to our consciousness.

Another mistake in explaining the origin of music is to deny any difference between bird's song and men's music, as has been done for instance in a review in the *Boston Leader*[1], where it is said "that birds have a time-sense, as anyone who listens to their songs must admit." I do not admit it, and many observers of the bird's song (whom I have quoted in my book) state the impossibility of writing these songs down in regular bars: i.e. they betray no time-sense. The reviewer evidently thinks of time in the sense of 'tempo' (quickness), not in that of 'Takt.' Rhythm is no doubt "the basis of all motion"—as the reviewer says—but 'Takt,' 'mesure,' 'time' is only the intellectual form of our perception of the motion; the bird's song has rhythm, but the bird no 'Takt,' no 'mesure.' But if my critic nevertheless still holds that the bird has a time-sense, and maintains that bird's song is on that account exactly the same as primitive man's music I will illustrate the striking difference even in a mere external quality, and ask: *Has anyone ever heard any animals sing in concert?* i.e. not only at the same time or responding to each other in immediate succession, but in accordance with each other, in unison? No, and herein lies the difference, this is the point that distinguishes a merely vocal utterance from music. True music requires a degree of observation, an intention and a participation of the intellect, and not *only* a momentary vocal reflex of feeling; it requires the form of time-ordered perception which is lacking in the animal and so strongly pronounced in the choral dance-music of primitive men. An individual vocal reflex arises and vanishes with the stimulus of the moment, while singing in concert requires a definite purpose, a definite arrangement of utterances, which are to be intentionally worked out, practised and preserved in memory. In this settled condition song would in time become monotonous, ineffective, and therefore calls for variety. Variety in face of tradition means progress, development, and thus choral music alone affords the only possible

[1] January, 1894.

starting point of our art; in its intrinsic character lies the germ of music. In the dances of men and animals we can observe a difference similar to that in music. Men dance in a unison and with a *symmetry*, which are wanting in animals' dances, and this deficiency is due to a mental cause which betrays—if I am not mistaken—the most serious difference between men's and animals' intelligence on record.

One can follow the importance of this distinguishing characteristic even in modern music. It is possible to be deceived as to the musical ability of a performer who performs alone, and who may make up by mechanical practice what is wanting in talent, but let him play in an '*ensemble*,' let him accompany the simplest song, and you will at once see what his music is like. This example again points to the chief psychical element of music which once more may be characterised as an *art d'ensemble*.

III.—THE METAPHYSICS OF THE TIME-PROCESS.

By F. C. S. Schiller.

I do not know whether Mr McTaggart's interesting investigation (*Mind*, vol. II. N. S. 490—504, vol. III. 190—207) of the relations of the Hegelian Dialectic to Time (or rather to the Time-process[1]) has obtained the attention it merits, but the problem he has so ably handled is of such vital importance, and the attitude of current philosophy towards it is so obscure, that no apology is needed for a further discussion of his results. That those results came upon me with the shock of novelty I cannot, indeed, pretend; for the impossibility of reconciling the truth of the Dialectic with the reality of the Time-process has long been familiar to me as the chief, and, to me, insuperable difficulty of the Hegelian position. I propose, therefore, to take for granted the reluctant conclusion of Mr McTaggart's almost scholastic ingenuity, namely that there is no known way of reconciling the (admitted) existence of the Time-process with the (alleged) "eternal perfection of the Absolute Idea"—at all events until some other commentator of Hegelism has attempted to revise and refute Mr McTaggart's arguments—and I wish to consider what inferences may be drawn from it with respect to the method of metaphysical speculation in general.

Before doing so, however, I ought, perhaps, to say a word on what Mr McTaggart himself inclines to regard as the positive result of his inquiry, the fact namely that he has not been able to show that there is *no* possible synthesis of the Absolute Idea with the Time-process, and that he is consequently "entitled to believe that one more synthesis remains as yet unknown, which shall overcome the last and most persistent of the contradictions

[1] I prefer to use the latter phrase in order to indicate that I do not regard "Time" as anything but an abstraction formed to express an ultimate characteristic of our experience, and in order to check, if possible, the tendency of metaphysicians to substitute verbal criticism of that abstraction for a consideration of the facts which we *mean* when we say *e.g.* that "the world is in Time." Of that tendency, I fear, even Mr McTaggart cannot always be acquitted (*e.g.* pp. 493—5), and it seems to me to be at the root of most of the metaphysical puzzles on the subject.

inherent in appearance." For faint as is the hope which nourishes this belief, and groundless as are the assumptions from which that hope may, I think, be shown to spring, one may yet congratulate Mr McTaggart on the candour with which he distinguishes his faith in the Unknown Synthesis from the cogency of a logical demonstration, and on the diffidence with which he declines to avail himself of Mr Bradley's convenient maxim to the effect that "what may be, and must be, that certainly is." For certainly, if one does not scruple to regard utter ignorance as the possibility that 'may be,' and the subjective need of saving one's own theory as the necessity that 'must be,' there is no difficulty which cannot be evaded by the application of that maxim and no contradiction which cannot be so 'reconciled.' My only fear would be that if such an axiom were admitted at the beginning of philosophy, it would also prove its end. Mr McTaggart, however, is to be congratulated on having eschewed the dangers of Mr Bradley's 'short way with the insoluble,' and on preferring to base his acceptance of conflicting views on the ancient, time-honored and extra-logical principle of Faith. Still more admirable, perhaps, is the robustness of a faith, which overlooks the curious inconsistency of denying the metaphysical value of Time, and yet expecting from the Future the discovery of the ultimate synthesis on which one's whole metaphysic depends. For myself I avow that such faith is beyond my reach. If I were driven to the conclusion that the inexorable necessities of my mental constitution directly conflicted with patent and undeniable facts of experience, I fear I should be beset by a sceptical distrust of the ultimate rationality of all things rather than solaced by the vision of an "unknown synthesis."

But in this case I hope to show that there is no need to respect a faith one cannot share, and that Mr McTaggart has given more to faith than faith demands.

If the contradiction cannot be solved, it can at least be exposed and explained. And unless I am very much mistaken, it will appear that the incompatibility between the assertion of the reality of the Time-process, and its comprehension by any system of 'eternal' logical truth (whether Hegel's or anybody else's) has its origin in very simple and obvious considerations.

Mr McTaggart cannot find room for the reality of the Time-process, *i.e.* of the world's changes in time and space, within the limits of Hegel's Dialectic. But is this an exclusive peculiarity or difficulty of Hegel's position? Is the Time-process any more intelligible on the assumptions of any other purely logical system, as for instance on those of Plato or Spinoza? I think the difficulty will be found to recur in all these systems. And

this shows that it is not accidental, but intrinsic to the *modus operandi* of all systems of abstract metaphysics.

They cannot account for the time-factor in Reality, because they have *ab initio incapacitated* themselves from accounting for Time as for change, imperfection and particularity—for all indeed that differentiates the realities of our experience from the ideals of our thought. And their whole method of procedure rendered this result inevitable. They were systems of abstract truth, and based on the assumption on which the truth of abstraction rests[1]. They aimed at emancipating philosophy from the flux to which all human experience is subject, at interpreting the world in terms of conceptions, which should be true not here and now, but 'eternally' and independently of Time and Change. Such conceptions, naturally, could not be based upon probable inferences from the actual condition of the world at, or during, any time, but had to be derived from logical necessities arising out of the eternal nature of the human mind as such. Hence those conceptions were necessarily *abstract*, and *among the things they abstracted from was the time-aspect of Reality.*

Once abstracted from, the reference to Time could not, of course, be recovered, any more than the individuality of Reality can be deduced, when once ignored. The assumption is made that, in order to express the 'truth' about Reality, its "thisness," individuality, change, and its immersion in a certain temporal and spatial environment may be neglected, and the timeless validity of a conception is thus substituted for the living, changing and perishing existence we contemplate. Now it is not my purpose here to dispute, or even to examine, the correctness of that assumption itself. What I wish here to point out is merely that it is unreasonable to expect from such premisses to arrive at a deductive justification of the very characteristics of Reality that have been excluded.

The true reason, then, why Hegelism can give no reason for the Time-process, *i.e.* for the fact that the world is 'in time,' and changes continuously, is that it was constructed to give an account of the world irrespective of Time and Change. If you insist on having a system of eternal and immutable 'truth,' you can get it only by abstracting from those characteristics of Reality, which we try to express by the terms individuality, time, and change. But you must pay the price for a formula

[1] I have in this sentence purposely used "truth" in two senses, in order to emphasize a distinction, which is too often overlooked, between the conceptual interpretation of reality, which is truth in the narrower sense, and the *validity* or practical working of those conceptual symbols, which constitutes their truth in a wider sense. (See below, p. 40.)

that will enable you to make assertions that hold good far beyond the limits of your experience. And part of the price is that you will in the end be unable to give a rational explanation of those very characteristics, which had been dismissed at the outset as irrelevant to a rational explanation. Thus the whole contradiction arises from a desperate attempt to eat one's cake and yet have it, to secure the eternal possession of absolute truth and yet to profit by its development in time! Surely this is *not* a fitting occasion for invoking that supreme faculty of Faith, to which philosophy, perhaps as much as theology, must ultimately appeal?

If these considerations are valid, the idea of accounting for the time-process of the world on any system of abstract metaphysics is predestined to failure, and must be declared mistaken in principle. But there remain two questions of great importance: (1) Do such systems of abstract metaphysics lose all value? (2) Is there any other way of manipulating the time-process so as to fit it into a coherent systematic account of the world?

In answering the first question it will be necessary to supplement the negative criticism of the claims of abstract metaphysics by tracing the consequences of their utter rejection. I have so far contended that no abstract metaphysic could say the last word about the world, on the ground that it was *ex vi definitionis* forced to reject some of the chief characteristics of that world. But if it cannot give us the whole truth, can it give us any truth? Is not the alternative to the rejection of the full claims of Hegelism (and kindred systems) a sceptical despair of the power of the reason to find a clue out of the labyrinth of experience?

Such a plea would not be devoid of a certain plausibility. Stress might be laid on the fact that the fundamental assumption of all abstract metaphysics is the fundamental assumption also of all science, that the whole imposing structure of the 'laws of nature' is formulated without reference to the temporal and spatial environment and the individual peculiarities of the things which 'obey' these laws, and so likewise lays claim to an eternal validity. How then can Metaphysic dare to reject an assumption on which the whole of Science rests? Again, it may be urged that from its very nature philosophy is an interpretation of experience in terms of thought, and must necessarily exhibit the intrinsic peculiarities of human thought. If abstraction, therefore, is characteristic of all our thinking, if all truth is abstract, it would seem that all philosophy must stand or fall with the abstract formulas in which alone our thought can take cognizance of reality, and may not dream of

casting off the shackles, or denying the sufficiency, of the systems of abstract truth which the ingenuity of the past has propounded.

Nevertheless I incline to think that it is possible to steer the human reason safely through between the Scylla of Scepticism and the Charybdis of an Idea absolutely irreconcilable with experience. But to do so it is imperative to define exactly the part played by abstraction in a philosophic account of the world.

Evidently, in the first place, it does not follow that because all truth in the narrower sense (v. *note* p. 38) is abstract, because all philosophy must be couched in abstract terms, therefore the whole truth about the universe in the wider sense, *i.e.* the ultimate account that can be given of it, can be compressed into a single abstract formula, and that the scheme of things is nothing more than, *e.g.*, the self-development of the Absolute Idea. To draw this inference would be to confuse the thought-symbol, which is, and must be, the instrument of thought, with that which the symbol expresses, often only very imperfectly, *viz.* the reality which is "known" only in experience and can never be evoked by the incantations of any abstract formula. If we avoid this confusion, we shall no longer be prone to think that we have disposed of the thing symbolized when we have brought home imperfection and contradiction to the formulas whereby we seek to express it—an accusation which, I fear, might frequently be made good against the destructive part of Mr Bradley's "Appearance and Reality"—to suppose *e.g.* that Time and Change cannot really be characteristic of the universe, because our thought, in attempting to represent them by abstract symbols, often contradicts itself. For evidently the contradiction may result as well from the inadequacy of our symbols to express realities of whose existence we are directly assured by other factors in experience, and which consequently are *data* rather than problems for thought, as from the 'merely apparent' character of their reality, and the moral to be drawn may only be the old one, that it is the function of thought to mediate and not to create. If so, our proper attitude will be this, that while we shall not hesitate to represent the facts of experience by conceptual symbols, we shall always be on our guard against their misrepresenting them, and ever alive to the necessity of interpreting our symbols by a reference to reality. In this manner I conceive that it would be possible to utilize the terms of abstract metaphysics, whenever they seemed to yield useful formulas, without erecting them into fetishes and giving them the entire mastery over our reason. From the tyranny of abstractions there would thus always be an appeal to

the immediacy of living experience, and by it many a difficulty which appals on paper would be shown to be shadowy in the field. And conversely, it would perhaps be possible for philosophy to grapple somewhat more effectively with the real difficulties of actual life.

Nor can I see why philosophers should fight shy of such a procedure. For surely the admission that philosophy is an interpretation of experience in terms of thought does not preclude us from the reinterpretation of our symbols by a reference to experience wherever that may seem expedient and profitable. Why should we commit ourselves to a task which must prove either illusory or impossible, that of the rational deduction of the self-evident? It is true that philosophic explanation came into being because experience is not wholly self-explaining. But to admit this is not to imply that everything requires explanation. For all explanation must set out from certain data, which may either be accepted as facts or considered self-evident, and in no wise necessitate or justify the attempt to explain everything, an attempt which must ultimately derive everything from nothing, by the power alone of an intentionally obscure vocabulary. What the data of such an ultimate explanation of the world should be, admits, of course, of further discussion; but I can see no reason in the nature of philosophy as such why the characteristic of Time should not be one of them. And if by a frank recognition of the reality of Time, Imperfection and Individuality we can reach a deeper, more complete and workable insight into the facts of experience, why should our philosophy be worse than one which is driven to reject them by ancient prejudices concerning the perfections which the world ought to possess?

The abstractions of metaphysics, then, exist as explanations of the concrete facts of life, and not the latter as illustrations of the former, and the Absolute Idea also is not exempt from this rule. Nor is it to a different conclusion concerning the subordination of abstract metaphysics that we are led by the consideration of the first argument adduced in their favour, the fact that all science shares their assumption.

That all science abstracts from the particularity and time-reference of phenomena, and states its laws in the shape of eternal and universal truths, is perfectly true. But this fact will not bear the inference it is sought to draw in favour of abstract metaphysics, and must not be allowed to prejudice the inquiry into the proper method of discovering an ultimate theory of the universe. For in the first place the treatment of its initial assumption by science differs widely from that of metaphysics. Science does not refuse to interpret the symbols with

which it operates: on the contrary, it is only their applicability to the concrete facts originally abstracted from that is held to justify their use and to establish their 'truth.' The mathematical abstractions which enable astronomers to calculate the path of a star are justified by their approximate correspondence with its observed position, and if there were any extensive or persistent divergence between the calculation and experience, astronomers would be quite ready to revise their assumptions to the extent even of changing their fundamental notions concerning the nature of space. But in the case of metaphysics the same principle is not, apparently, to apply. If the Dialectic of the Absolute Idea does not accord in its results with the facts of life, we are not to suspect the Dialectic. It possesses an intrinsic certainty by right divine which no failure can be admitted to impair. If the logical (or rather *psychological*) development of the Idea fails to account for the development in time, we may at the utmost postulate an "unknown synthesis." This *may* be philosophy, but it does not look like science.

In the second place, let us ask *why* science abstracts from the particularity of reality. Not, certainly, because it does not observe it. Nor yet because it ascribes to the deductions from its universal laws a precision which they do not possess. On the contrary, it cheerfully admits that all the laws of nature are hypotheses, represent not the facts but tendencies, are to be used merely as formulas for calculating the facts. But why should we want to calculate the facts by such universal formulas? The answer to this question brings us to the roots of the matter. We make the fundamental assumption of science, that there are universal and eternal laws, *i.e.* that the individuality of things together with their spatial and temporal context may be neglected, not because we are convinced of its theoretic validity, but because we are constrained by its practical convenience. *We want to be able to make predictions about the future behaviour of things for the purpose of shaping our own conduct accordingly.* Hence attempts to forecast the future have been the source of half the superstitions of mankind. But no method of divination ever invented could compete in ingenuity and gorgeous simplicity with the assumption of universal laws which hold good without reference to time; and so in the long run it alone could meet the want or practical necessity in question.

In other words that assumption is a *methodological* device, and ultimately reposes on the practical necessity of discovering formulas for calculating events in the rough, without awaiting or observing their occurrence. To assert this methodological character of eternal truths is not, of course, to deny their validity —for it is evident that unless the nature of the world had lent

itself to a very considerable extent to such interpretation, the assumption of 'eternal' laws would have served our purposes as little as those of astrology, chiromancy, necromancy, and catoptromancy. What, however, must be asserted is that this assumption is *not* an ultimate term in the explanation of the world.

That does not, of course, matter to Science, which is not concerned with such ultimate explanation, and for which the assumption is at all events ultimate enough. But it *does* matter to philosophy that the ultimate theoretic assumption should have a methodological character. To say that we assume the truth of abstraction because we wish to attain certain ends, is to subordinate theoretic 'truth' to a teleological implication: to say that, the assumption once made, its truth is 'proved' by its practical working, by the way in which it stands the test of experience, is to assert this same subordination only a little less directly. For the question of the 'practical working' of a truth will always ultimately be found to resolve itself into the question whether we can live by it.

In any case, then, it appears that scientific knowledge is not an ultimate and unanalysable term in the explanation of things: Science subordinates itself to the needs and ends of life alike whether we regard its origin—practical necessity, or its criterion —practical utility. But if so, the procedure of Science can no longer be quoted in support of the attempt to found our ultimate philosophy upon abstract and 'eternal' universals. If the abstraction from time, place and individuality is conditioned by practical aims, the next inquiry must evidently concern the nature of these practical aims, to which all theoretic knowledge is ultimately subsidiary. And if those aims can be formed into a connected and coherent system, it will be to the discipline which achieves this that we shall look for an ultimate account of the world. Is there then a science which gives an orderly account of the ends of life that are or should be aimed at? Surely Ethics is as much of a science as abstract metaphysics, and if it be the science of ultimate ends, it seems to follow that *our ultimate metaphysic must be ethical.*

Let us consider next what the attitude of such an ethical metaphysic would be to the metaphysical pretensions of abstract universals and the time-process respectively. It seems clear, in the first place, that practical aims, or a system thereof, do not easily lend themselves to statement in terms of abstract universals. For an end or purpose seems to be intrinsically the affair of a finite individual in space and time, and the attempt to regard the timeless, immutable and universal as possessed of ends seems to meet with insuperable difficulties. If, therefore, the ultimate explanation of the world is to be in terms of ends,

it would seem as though it must be in terms of individual ends, realized in and through the Time-process. Nor is there anything repugnant to reason in the conception of an end realized in a time-process that would render it difficult for a teleological explanation to admit the reality of the time-process. On the contrary, if the transition from means to end were instantaneous, the distinction between them would vanish, and lose all meaning. Still less has it been found repugnant either to the reason or to the feelings of men to regard the Time-process as the realization of an end or even of a multitude of individual ends, *e.g.* as a process of spiritual redemption. There is, therefore, perfect harmony between an ethical metaphysic and the existence of individuals in Time and Space, while that existence is found to be irreconcilable with any abstract metaphysical formula.

We must conclude, then, that the method of explaining the ultimate nature of the world by an abstract universal formula, or a series of such, is *not* supported by the methodological use of similar formulas in the natural sciences, which, rightly considered, leads to very different inferences. What compensation then has it to offer us for its inability to take account of many of the chief data which a comprehensive philosophy has to explain? Surely the full reality which has to be explained is the individual in the Time-process. And though it will remain no trivial task to exhibit the rationality of the Real, it has yet become evident that rationality is but one of several attributes to be predicated of Reality, and that a mere rationalism or 'panlogism,' therefore, can never be anything but a one-sided philosophy.

We have to consider next the second question raised (on p. 39) as to whether by pursuing a different method philosophy is able to recognize the reality of the Time-process. And if such philosophic recognition is possible, what is the metaphysical value and methodological bearing of the reality of Time (or rather of the Time-process)? Or is there possibly, as Mr McTaggart suggests (*Mind*, N. S. II. p. 496), "something about Time which renders it unfit, in metaphysics, for the ultimate explanation of the universe"? The prejudice to this effect is no doubt well-founded from the standpoint of a philosophy whose initial abstraction excludes Time. But if we decline to hamper ourselves by a method which fails *de facto* to account for Time and imperfection, while its claim *de jure* had to be disallowed as ignoring the supreme practical limitations under which the whole understanding operates, the case is different. It has already been shown that an ethical metaphysic has no difficulty in conceiving the ultimate end as realizable in the Time-process. And indeed from such a standpoint it is possible

to indicate an explanation even of the Becoming which is so puzzling a characteristic of the Real, and the source of all our conceptions of Time and Change—it may be ascribed to the struggle of finite existence to attain that ultimate end. Instead of being left over as an inexplicable surd at the conclusion of a metaphysical explanation, the Time-process thus becomes an integral part of that explanation, and a fruitful source of inquiry opens out to philosophy concerning its value in the discovery and estimation of ultimate truth. It would be impossible within the limits of this paper to attempt any detailed account of the metaphysical conclusions to which the admission of the reality of the Time-process would lead. Suffice it to say that I am convinced that the system we should arrive at would prove no less coherent and complete than any of the great systems of abstract metaphysics, and that the difficulties which it may at first sight seem to involve are due to an (inconsistent) reversion to the methods of abstract metaphysics.

There are however two points which it seems necessary to emphasize. The first is that a metaphysic of the Time-process will stand in the same relation to the explanation of phenomena by their *history*, as a metaphysic of abstract ideas stands to their explanation by universal laws, *i. e.* the Historical Method will represent the application in science of the metaphysical principle. But while to an abstract metaphysic the Historical Method must ultimately be foolishness, a metaphysic of the Time-process will justify that method by expressing it in a metaphysical, *i. e.* final, form. And this alone would suffice to prove its superiority; for now-a-days we can as little dispense with the explanation of things by their history as with their explanation by universal 'laws.' A philosophy, then, which admits both and vindicates the use of the one, without invalidating the other, (even though it regards its importance as methodological and subordinate rather than as supreme,) is manifestly superior to a philosophy which absolutely rejects one of the most valuable of the working assumptions of science. And if we regard the fact that there is a development of the world in Time as the essence of Evolution, it is obvious that only a theory which accepts this Time-process as an ultimate datum will be capable of yielding a philosophy of Evolution and is worthy of the name of Evolutionism.

The second point concerns the ultimate difficulties which are left over on every known system of philosophy, and form antinomies which are insoluble for the human reason as it stands. Such, on Mr McTaggart's theory, are the existence of change and imperfection, such, in his opinion, would be the beginning of the Time-process on mine. Now in face of these

facts an abstract metaphysic is in an extremely awkward position. If it scorns to excuse its failure by pious phrases concerning the infinite capacity of a non-human mind to solve the insoluble, if it dreads to have recourse to the more impious ἀργὸς λόγος of Mr Bradley, and to postulate an Absolute which 'absorbs,' 'transmutes,' 'submerges,' 'suppresses' and 'reconciles' all difficulties *ex officio*, in a manner no doubt highly satisfactory to itself and Mr Bradley, two alternatives remain. Either the idea that a contradiction is a necessary proof of falsehood must be given up, and one or both sides of the antinomy must be accepted in spite of everything—in which case it is hard to say what weapon would be left to refute the most patent absurdities; or one must hope for such an enlargement of the human reason as will give it an insight into what is at present incomprehensible. For the difficulties in question have been under scrutiny too long to render it credible that any thinkable solution has been overlooked. If, however, a development of the human mind be admitted, the reality of the Time-process, in which that development takes place, can no longer be denied, and abstract metaphysic becomes indebted to it for the means to solve its difficulties. Is it not curious, then, to go on maintaining that the Time-process is unfit to form a factor in an ultimate philosophy?

An evolutionist philosophy on the other hand would not only be entitled, but bound, to await a solution of its difficulties from the secular development of the Time-process which had generated them. For its ultimate appeal is not to the abstract reason but to experience, to the Time-process in which that reason develops. It is consequently an *ignoratio elenchi* to infer that a view leading to an antinomy is false, unless it can be shown that the antinomy is a permanent one. But not only is that impossible, but a solution *ambulando* may be expected on two grounds. (1) Reality, the data of our reasonings, may so change as no longer to suggest the antinomy. For instance, the problem of imperfection would vanish, if reality attained to perfection and not even a memory remained of the imperfect. And (2) the antinomy might be resolved by such a development of the mind as would enable it to see through its present difficulties. As for instance, if we could view the world from the standpoint of Mr Bradley's Absolute. I am aware that many of our present philosophers have a rooted objection to putting their hope in the future; yet it is only in the direction of an abandonment of the prejudice against the reality of Time, that I can descry a future for hope, a future for philosophy and a philosophy for the future.

F. C. S. SCHILLER.

IV.—THE RELATION OF ATTENTION TO MEMORY.

By W. G. Smith.

It is obvious to every one that there are endless degrees of certainty and security in the knowledge which we have acquired, whether it be practical or scientific. Some things we cannot help recollecting: other things pertinaciously refuse to be recalled, or they come into our consciousness only after great effort. If we try to give an account of the reasons why some given fact or experience has impressed itself on our memory, we find ourselves at once able to name a large number of factors which may have had some share in bringing about the result. Our memory may be distinct and ready because our interest was aroused when the fact first became known to us. We may have given special attention to the fact apart from its emotional character, or we may have had it presented to us in a specially vivid and intense form. It seems plain also that the power of recollecting will depend in part on the general physiological condition of the individual, on the degree of his health or strength, at the time when he first acquires his knowledge as well as at the time when he attempts to reproduce it.

Some of the factors which condition memory have already been the subject of important researches. One problem among others of which Ebbinghaus[1] has given the solution, has been that of ascertaining what effect the lapse of time since learning series of meaningless syllables has upon the ability subsequently to reproduce such series. A similar though much simpler problem has been studied by Wolfe[2] in his investigation regarding the duration of our memory for musical tones. Recently Müller and Schumann[3] have studied the effects of rhythm and other modifications of the internal relations between the syllables in series like those used by Ebbinghaus. Evidently it is to such investigations as those, carried out according to

[1] *Über das Gedächtnis.*
[2] *Philosophische Studien*, III. p. 354.
[3] *Zeitschrift für Psychologie und Physiologie der Sinnesorgane*, VI. p. 80.

the experimental method, that we must look for definite and exact information regarding the conditions of memory and the actual processes involved in its working.

One of the elements in memory of whose efficiency we are sure, but whose exact function has not yet been studied, is that of Attention. It is this problem, the relation of Attention to our power of associating and recollecting objects presented to consciousness, that is dealt with in the following investigation. It was in the course of experimental work dealing with the subject of Mediate Association[1] that its importance and the need of a separate study of the problem became evident. My aim has been to isolate this factor and shew what is the effect when a subject or observer submits himself for the purposes of experiment to conditions which bring about various forms of distraction. I arranged and began the series of experiments which are here described in the Leipzig Institute for Experimental Psychology in the summer of 1893: they have been carried on since in the Physiological Laboratory, Oxford, in the summer of 1894[2]. To all those who have assisted, whether as reagents or in giving advice and help, I wish to express my heartiest thanks.

The method employed by Ebbinghaus of repeating aloud series of meaningless syllables till they could be said by heart seemed inapplicable to the present problem. If it is difficult to keep a given state of attention constant for short intervals, the difficulty could only be heightened by the increase in the length of time required for learning when the attention is distracted. And if the object be to isolate the process of attending from the other processes which normally enter into the act of memorising, then we must have some means for analysing the complex elements involved in such a mode of memorising as that adopted by Ebbinghaus. On the other hand the method employed by Münsterberg in his investigation *Die Association successiver Vorstellungen*[3], and elsewhere, seemed capable of being used for the purpose of this investigation. The principle of this method consists in presenting the subject matter which the reagent has to commit to memory in such a way that he acquires a certain knowledge of it; by noting the number and kind of errors committed in the attempt to reproduce what has been learned one obtains a measure of

[1] This Journal, III. N.S., p. 289.

[2] A paper describing these experiments was read before the Physiological Section of the British Association for the Advancement of Science at the Oxford meeting, 1894.

[3] *Zeitschr. f. Psych.* I. p. 99. Cf. *Beiträge zur experimentellen Psychologie*, Heft IV. p. 121.

the strength and accuracy of the associations which have been formed. Obviously, if the conditions under which the subject matter is presented remain constant, the total of errors committed ought to remain fairly constant; there seems theoretically no reason why the process of learning should be carried to the point where the memory becomes perfect. The method employed in the following experiments is in principle the same as that initiated by Münsterberg: in detail however there are many variations.

Letters of the alphabet, presented in such a way that disturbing ideas and associations should not readily be suggested, formed the subject matter which the reagent had to commit to memory. They furnish a convenient and easily variable material, and though objections, which will afterwards be referred to, may be made to their use, yet practically it was found that they were sufficient for the purpose in hand. After a considerable number of experiments involving a trial of various modifications, the following method was adopted and with slight changes employed in all the experiments whose results appear in the Tables. Twelve letters arranged in three lines, one above the other, were written on a card[1]: the card was placed on a stand so that the subject who sat close by could read the letters with perfect ease. Previous to the actual experiment the part of the room where the reagent sat was in darkness; by a suitable arrangement the person in charge of the experiments could illuminate the card for any desired length of time[2]. The time chosen for exposure was ten seconds; at the close of this interval, or in the later experiments after a pause of approximately two seconds, the subject was required to repeat as much as he could remember of what he had learned while the card was visible: this together with his remarks was then recorded.

Perhaps the greatest difficulty in the investigation lay in the arranging of conditions which would secure variation of attention without involving any too complicated mental activity on the part of the subject. The forms of distraction used must be simple and must at the same time have a distinct and appreciable effect. In various researches dealing with the

[1] A copy of one of the cards taken at random may be given:—

b f l g
s w k r
t x m d

[2] In the first experiments the light was furnished by a small incandescent electric lamp: later this was replaced by an ordinary gas-burner the supply of which could be regulated at will. During the actual experiment the reagent was completely screened off from the person conducting the experiments.

relation of attention to reaction-time, the distraction has been brought about by different kinds of sensory impression, such as the playing of music, the beating of a metronome, or successive flashes of light. It is plain however that such a means of producing inattention would be of little use here: the conflict between a series of sense-presentations and the somewhat engrossing activity involved in learning a combination of letters would be too one-sided and unequal. In one group of experiments a metronome was kept beating while the experiment was going on; the subjects however remarked that they did not notice the sounds at all while learning. It was suggested that by requiring the subject to introduce into the regular beating of a metronome which was set agoing beside him rhythms of varying complexity, one could obtain distinct and simple forms of distraction. As however no definite or constant result was obtained by this method, it was abandoned for the one which was employed in all the experiments which are summarised in the Tables. According to it the activity involved in memorising is interfered with by another form of activity.

A distinct but not too complicated device for securing what one may call mental distraction consisted in requiring the subject, while learning the letters on the card, to perform a simple sum in addition, viz., that involved in repeating the series 2, 4, 6, 8,... or rarely, when the former series tended to become too mechanically easy, the series 3, 6, 9.... In order that an effective control over the behaviour of the subject might be secured, he was required further to repeat the numbers aloud and to make each step in the addition coincide with the stroke of a metronome beating at the rate of 60—70 strokes per minute. In order to compare the results of this form of distraction with those gained when the vocal organ was exercised, but the mental activity implied was relatively small, the subject was required in the experiments of the next group[1] to repeat with each stroke of the metronome a simple syllable such as *la*. The distraction caused by speaking was next compared with that caused by employment of another set of muscles, viz., those employed in tapping the table with the forefinger, each tap coinciding with a beat of the metronome. Lastly experiments were made in order to gain a normal result

[1] In order to facilitate reference to the different sets of experiments, all those involving one special form of distraction are taken together and referred to as a group. The groups are given here in the order in which they appear in the various Tables. Speaking generally, we may say that in group I. the distraction was mental, in group II. vocal, in group III. muscular.

and see the value of reading alone without any distraction save that caused by the fact that the metronome continued to beat. The order in which the distractions were introduced was varied, but they were always arranged so that before any one of the four variations could recur, the other three had been tried. The rate of the metronome was kept constant for each set of four experiments, and in each hour the total number of successful experiments numbered four or a multiple of four. When owing to any cause an experiment did not succeed, further experiments were made until an even number was reached: in this way there was some guarantee that conditions favourable or unfavourable to the memory would affect all groups equally. No attempt was made to keep the interval between the experiments constant; such a constancy seems by no means so necessary with this method as it is when an engrossing and wearying effort has to be kept up for a prolonged interval. In any case the work of recording the observations of the reagent makes such constancy very difficult. No system was used in choosing the cards for the experiments; it could only be rarely and by accident that different individuals had to memorise the same combinations of letters in the same groups. Not more than twice or thrice in all the experiments was the same card used over again with any one individual.

There are two methods by which one can numerically estimate the value of the answers given by the subjects. The method of summing errors has already been referred to. The other method consists in estimating the value of what has been actually given, instead of paying attention only to what has not been given or has been given wrongly. Each takes expressly into account what the other has neglected: with a sufficiently large number of experiments the two methods ought to give similar results. The first or negative method of estimation does not resemble any procedure employed in practical life: the second or positive method, on the other hand, relies on the principle of positive valuation commonly employed in estimating the answers given in examinations.

In dealing with the errors according to the negative method the following classification was adopted. The first class (*o*) consists of cases in which a letter is omitted which was written on the card, the second (*i*) of all cases in which a letter is inserted which ought not to be present, whether that letter was not on the card, or though upon the card is wrongly given a second time. In the third class (*d*) are included errors due to displacement or disorder, whether that is owing to reproduction in partly wrong order, or to complete ignorance of the position. Each error has the same weight attached to it and counts 1;

the total number of errors gives a basis for estimating the work of the memory in any instance.

The arrangement of values according to the positive method was more difficult; one is liable indeed to the charge of arbitrariness in affixing any kind of value. The following classification however seems based on a natural and definite principle of division. The letters which were reproduced were arranged in three classes: (1) the letter named is given in an entirely wrong position, or its position is quite unknown: (2) the subject has a certain imperfect knowledge of the position and order; the letter is put in the right line, or in its correct place in a group of letters which is in a wrong position: (3) when everything is right as regards the letter, full value is given. Corresponding to the three degrees of correctness, three values are assigned; to the letters of the first class is given the value 1, to the third the value 3; the letters of the second class receive the intermediate value 2. A perfectly correct answer then would receive 36 marks; according as the answer is more or less incomplete the total value varies. A more complicated system of valuation, which differentiated more exactly between the different kinds of displacement or disorder included in the second class, was employed in the first estimation of the results. A special value, for example, was given where the order was simply reversed: then, however, the question arises, what is to be done with a case of reversed order inserted in the wrong line? All such complications are avoided by the division given above, which is based on a perfectly simple principle. As a matter of fact the results gained by the two systems agree in all essential points. It happened not unfrequently in the earlier experiments that an individual gave several letters in a line without indicating whether he had any recollection of their position in the line. After some hesitation I decided to regard this lack of positive information as equivalent to uncertainty on the part of the subject as to the actual position of the letters. When a letter was wrongly inserted or repeated, it was simply disregarded; in the case of repetition the benefit of the doubt was given, and that letter taken into account which approached most closely to the correct position. It may be said that according to this procedure an essential feature in the answer is unjustifiably neglected. It is plain, however, that if the method of positive valuation is to keep strictly to its principle of recognising what is actually correct in the answer, cases of insertion cannot properly be taken into account. In fact, as will be seen from an inspection of Table III. which gives an analysis of the errors in each group, these cases form a pretty

constant, and in most cases relatively unimportant element in the total of errors. It is however easy to subtract from the mean totals in Table IV. the average errors of insertion: the result, it may be remarked, is either to remove or lessen the discrepancies which exist between the two Tables.

As was before remarked, the reproduction by the subject of what he recollected followed in the earlier experiments immediately after the illumination of the card ceased. The result of this arrangement often was that the subject, fearful lest all should disappear, tried to give with a rush what was in his consciousness at the moment, or seemed in perfect readiness for being reproduced. As this tended in some measure to defeat the purpose of the experiments by reducing the part played by memory, the mode of reproduction was changed. Accordingly, in the second division of the experiments the subject was required to give what he remembered at a signal which followed two seconds later. This, it is plain, introduces a new and disturbing factor, for the question at once arises; what is being done in the two seconds? In order to prevent further repeating and memorising during this pause the subjects were directed to continue the activity which had during the time of exposure served as a means of distraction. It may be objected that the original inequality of these activities as regards their ease of execution would interfere here and cause varying loss of memory during the pause: this must be admitted, especially since in the last group there was no distraction. But it must be pointed out that this inequality, so far as our knowledge goes, would have its effect not through varying difficulty, but mainly through the varying completeness with which the field of consciousness was occupied by the activity. The amount of work we do in the interval between learning a task and reproducing what we have learned may have an effect on memory, but this factor, so far as I know, has never been directly taken into account and experimentally studied. Had a new and uniform mode of occupying consciousness been employed in the pause, there would still have been possibilities of error: the reagent must suddenly recollect and start upon something new, an effort whose difficulty would vary according to the difficulty of the preceding effort.

It has not seemed necessary to give in separate tables the results of the experiments involving the two different methods of reproduction. On calculating the results separately it was found that the difference between the two sets of results was not great or important. There are variations of course, not merely in the absolute totals but also, though seldom, in the relative positions assigned to the groups in the two divisions.

But these variations seem to be of the same nature and extent as those which were found when each half of the experiments, furnished by the first three reagents mentioned in Tables II. III. and IV. was calculated separately for each individual. That no constant and appreciable factor is neglected by presenting the results together can be definitely shewn. The following Table gives the mean of the average values assigned to the subjects in the first (A) and in the second (B) division of the experiments. The upper line in each division gives the results obtained by the negative, the lower those given by the positive method. The numerals in the first horizontal column designate the groups in the way already mentioned; the total number of experiments in each group, except the third, is for the first division 29. The third group was started later and includes 19 separate results. In the second division, owing to a slight irregularity in arrangement, the numbers differ slightly for the different groups; in the first there are 33, in the second and third 34, and in the fourth 33 experiments.

TABLE I.

	I	II	III	IV
A	10·0 11·9	9·5 15·3	8·2 16·4	7·55 21·4
B	10·1 11·3	8·5 15·6	8·0 17·6	7·4 21·3

This Table, it ought to be remarked, contains the results of experiments made with the last six subjects whose experiments are given in the succeeding Tables. The experiments made with Wh., A. and B., the first three subjects, all involve a pause of two seconds after memorising; they differ however as regards the way in which this pause was employed. Wh. did nothing during the two seconds, being directed to remain perfectly passive; A. in many cases forgot to carry on the activity which had served as a means of distracting, but did not attempt actively to memorise. B. on the other hand fulfilled the directions with much greater exactness. The resemblance of the results gained under the various conditions gives ground for believing that the relative values assigned to the groups represent constant and definite processes, and that the slight modifications in method do not in any appreciable degree

interfere with the main variations which it was the purpose of the experiments to study. In Table II., which is given below, the results are analysed according to the first or negative method. The first vertical column contains the letters which have been used to designate the different subjects. Under N is given the number of experiments made by the subject in each of the four groups: the total number of his separate results is thus got through multiplying this number by 4[1]. The character of the various groups has already been described. Under a is given the average value of each experiment; under mv the mean variation of each actual experiment from the average, this figure being got by adding together all the amounts by which each separate result differs from the average, and then finding their mean. Under r is given the probable error of the average a, calculated according to the formula $r = 0{\cdot}6745\sqrt{\frac{\Sigma v^2}{n(n-1)}}$, Σv^2 being the sum of the squares of the amounts by which each result differs from the average, and n the number of results concerned. In Table III. is given the average number of errors of each reagent in the three classes (*o, i, d,*) already described.

TABLE II.

		I			II			III			IV		
	N	a	mv	r	a	mv	r	a	mv	r	a	mv	r
Wh.	24	8·8	2·5	0·37	8·5	1·75	0·31	7·7	1·8	0·35	7·0	1·7	0·28
A.	19	8·3	1·3	0·31	7·3	1·8	0·35	6·7	1·7	0·33	6·8	1·5	0·29
B.	22	10·1	1·5	0·28	8·9	1·2	0·31	7·9	2·0	0·38	8·5	2·2	0·41
He.	15	9·3	1·2	0·25	7·7	2·5	0·49	7·4	2·8	0·66	8·7	1·7	0·40
W.	15	9·9	1·4	0·31	9·1	2·0	0·46	8·2	1·6	0·40	7·4	1·8	0·40
G.	10	11·6	2·1	0·54	11·7	2·6	0·59	10·6	2·5	0·79	8·8	2·0	0·53
M.	7	8·6	0·9	0·29	8·4	1·0	0·35	5·7	2·5	0·77	4·4	1·6	0·59
K.	8	11·1	2·1	0·68	8·75	0·85	0·36	8·75	1·0	0·33	7·4	1·6	0·52
H.	7	9·4	1·5	0·35	7·8	1·4	0·58	8·6	1·6	0·53	8·0	1·1	0·39

[1] The deviations from this rule are so few that they are best given in a note. The following corrections should be applied in Tables II. and IV.:—the number of experiments made by He. W. G. in Group III. should be 11, 10, 8, respectively instead of 15, 15, 10, and by G. in Group II. 11 instead of 10.

TABLE III.

	I			II			III			IV		
	o	*i*	*d*	*o*	*i*	*d*	*o*	*i*	*d*	*o*	*i*	*d*
Wh.	5·8	0·9	2·1	5·2	1·0	2·3	4·4	1·1	2·2	4·2	0·9	1·9
A.	5·7	0·9	1·7	4·5	1·2	1·6	3·8	1·1	1·8	3·9	1·1	1·8
B.	4·3	1·9	3·9	4·0	1·2	3·7	3·7	1·4	2·8	3·05	2·15	3·3
He.	7·7	0·2	1·4	5·9	0·5	1·3	5·2	1·1	1·1	4·65	1·65	2·4
W.	6·9	0·9	2·1	5·9	1·1	2·1	5·1	1·1	2·0	4·0	0·8	2·6
G.	5·6	2·9	3·1	5·0	3·2	3·5	4·0	2·7	3·9	3·5	2·1	3·2
M.	7·6	0·1	0·9	6·4	0·7	1·3	3·3	1·0	1·4	1·7	1·6	1·1
K.	5·9	1·2	4·0	4·0	0·9	3·85	4·5	0·9	3·35	2·5	1·5	3·4
H.	8·3	0·55	0·55	6·7	0·1	1·0	7·6	0·3	0·7	4·0	0·4	3·6

In Table IV. are given the figures representing the values of the different groups when the results are analysed according to the positive method. The Table is constructed on the same plan as the second. The amounts assigned according to the three degrees of value assumed by the positive method have not been summed up separately[1].

TABLE IV.

		I			II			III			IV		
	N	*a*	*mv*	*r*	*a*	*mv*	*r*	*a*	*mv*	*r*	*a*	*mv*	*r*
Wh.	24	15·0	3·6	0·62	16·8	3·2	0·55	19·2	4·0	0·72	20·0	2·9	0·49
A.	19	15·8	3·4	0·68	19·8	3·8	0·76	21·4	4·3	0·77	21·2	3·2	0·58
B.	22	15·9	2·9	0·53	18·1	4·0	0·73	20·4	3·1	0·57	27·2	3·3	0·64
He.	15	11·0	1·6	0·34	16·5	5·9	1·17	18·1	4·8	1·23	17·9	2·9	0·63
W.	15	11·6	2·5	0·55	14·2	3·3	0·75	17·4	3·8	1·04	19·9	3·9	0·94
G.	10	13·4	4·4	1·11	14·5	3·8	0·95	18·1	2·85	0·82	20·6	2·8	0·88
M.	7	12·0	2·0	0·67	14·7	2·3	0·77	23·3	6·4	1·97	28·6	3·2	1·14
K.	8	11·5	3·4	1·06	17·1	2·9	0·89	15·9	2·1	0·68	22·0	3·5	1·05
H.	7	10·3	2·2	0·76	14·6	3·4	1·35	12·3	3·2	0·93	19·7	1·8	0·56

[1] It may not be amiss to give the figures representing the average result for all the subjects in each group : they present a sort of typical curve. The numbers in the upper and lower lines give the results of the negative and positive analysis respectively.

I.	9·7	II.	8·7	III.	7·95	IV.	7·4
	12·9		16·3		18·5		21·2

Before going on to discuss the theoretical value and meaning of the numerical results given in the Tables, I wish to refer shortly to the question how far the methods of experimenting and handling the results are trustworthy. One can judge best of such matters by presenting data such as we have in the foregoing tables. The question, for example, whether combinations of letters of the alphabet will not, when used as subject matter for memorising, give results too uncertain and variable to allow of any conclusion as to the actual processes of association and memory, receives its answer in the foregoing numerical analysis. It is difficult to see how the regularity and constancy of the numerical values can be explained if the method be unreliable. To say that in a single experiment any one letter or combination of letters reproduced may be due to accident is true; to conclude that therefore the same error attaches to prolonged series of experiments is not justified. Nor does the fact that the same letters are employed more or less often during the course of an hour create a difficulty: the combinations of letters employed are thoroughly uninteresting, and have no tendency to remain fixed in memory after a particular experiment has been finished. In any case the possible errors arising from this cause will obviously distribute themselves over all the groups, and disappear as the number of experiments increases.

This last observation applies equally when we consider the errors due to slight variations in the time of exposure, in the length of the pause, in the rapidity with which the subjects react to the signal for reproduction in the various cases. That different combinations of letters will be learned with varying ease or difficulty is also a feature which necessitates having a fairly large number of observations. Two practical sources of error remain to be mentioned: first, the tendency to form intelligible words out of the letters presented; second, the irregularity with which the distracting activities were carried on during the time of exposure and during the pause. As regards the first error, it has to be noted that with almost no other observers than A. and B. did it make its appearance. Where it does appear however, this tendency is very annoying; when once the idea of forming intelligible words out of the letters occurs to the subject, it is very difficult to suppress it, however much he may wish to do so—in fact the more he wishes the more difficult is it. I have excluded the cases where this error distinctly endangered the result; in the case of the observer A. very many experiments had to be rejected for this reason. The second error illustrates the difficulty of carrying out two conscious activities simultaneously. Whenever the

subject broke down during the experiment, for example, when the attempt to do the sum in addition proved a complete failure, then the experiment was stopped. When however the irregularity in keeping time with the metronome and in the other processes was not too great, the observation was accepted. As the state of mind during the pause is not so important, and as it was advisable not to disturb the reagent by insisting too rigidly that the distracting activity should be carried on through the pause, a greater latitude was allowed in this respect. In all cases however it was understood that the pause was not to be used for the purpose of actively memorising. The question may be raised, what happens when the reagent remains passive during this interval? As far as I can gather, a sort of after image of a line or part of a line seems to be present; it is faint and indefinite in the most of cases, and gradually fades away.

In order to give opportunity for judging of the extent to which the averages of the total errors and of the positive values given in Tables II. and IV. really represent the actual observations, both the mean variation and the probable error have been calculated. The former measures the average extent of deviation from the mean, and in doing so naturally gives great weight to a large deviation. One or two such deviations occur in almost every series, usually one positive deviation being nearly compensated by an opposing negative deviation: they have in every case been included, and no number has been rejected because it was unusually large or small. It is obvious, however, that such deviations are abnormal, and that the mean variation, which makes one bad observation outweigh several good ones, does not give any true representation of the character of the deviations; the larger the error is the less likely is it to occur. For this purpose the probable error is the best guide: in it both the extent of the deviations and the probability of their occurrence are taken into account: the resultant figure r gives the range on either side of the mean within which the observations probably fall. With the help of the mean variation and the probable error we can compare the results here obtained with those given in other researches: it will be granted I think that, comparing the extent of the probable error given in Tables II. and IV. with that reached in the observations of Ebbinghaus, or the mean variation with that which Oehrn[1] finds in experiments similar to those of Ebbinghaus, one finds a sufficient regularity and steadiness in the values assigned by both methods to the various stages of memory.

[1] *Experimentelle Studien zur Individualpsychologie.*

The reliability of the positive method of valuation seems confirmed by the close correspondence which the relative positions assigned by it to the various stages of memory shew with those indicated by the other method: with few exceptions what is proved to be a weakened memory by one method is likewise proved by the other. With absolute values we have here of course primarily nothing to do; it is the relative positions assigned to the different groups that is our chief concern. That the classification of values adopted in the working of the second method is merely arbitrary could in no case be reasonably maintained; that it is in a high degree trustworthy seems proved not merely by the constancy of the relative values which it assigns, but by the general support which it gives to the negative method. The discrepancies between the two methods which do exist can in most cases, as before remarked, be removed or lessened when errors of insertion are taken into account in the second method as well as the first. The other divergencies are only such as might be expected, for it is only roughly that the two methods supplement each other. This is at once apparent when the values assigned to single experiments are considered; it is only when a larger number of observations are taken that the correspondence becomes definitely established. With respect to single experiments it is the second method which gives the truer estimate—truer in the sense that the relative positions indicated by it correspond more closely to the final relations of the groups as established by both methods than do those gained where the sum of errors is considered.

In beginning experiments care was always taken that the subject should by actual experiments become familiarised with the task he was required to perform. A considerable amount of practice was gone through by several of the subjects before the final experiments began, owing to the number of tentative experiments that were carried through at the beginning of the investigation. That the influence of practice and exercise can not be so great here as in experiments where a certain more or less difficult task has to be done perfectly, and to be persisted in till finished, seems clear; where the learning on the other hand is continued only for a short time with no aim at final correctness, it is obvious that the subject has far less drill and that there will be less growth in the facility of learning than where series of syllables have to be learned by heart. And at the same time we may expect that the influence of weariness will also shew itself much less where a method such as the present is used. As a matter of fact, while one observer complained of being tired at the end of an hour's work, another was surprised

at such a complaint; the others made no remarks on the subject. Only in regard to one of the groups, the third, was the remark made that the task seemed to become distinctly easier. That in general there was a gradual improvement in the memorising ability of the subjects may be concluded from an inspection of the figures in Table I.; in this Table however the results in the second division shew the effect of exercise complicated with other factors. In order to gain more exact data I have analysed separately the results of the three observers who have furnished the longest series of experiments, the average values for the first and second halves of the series being calculated for each group. In some cases there is a fall in the value of the memory: in the majority of cases there is a rise, which however is not specially conspicuous in any one group. With reference to the capabilities of the persons who assisted in the investigation, it may be remarked that all save one are graduates or students of philosophy and psychology, while three are teachers of philosophy.

The general features of the results presented by this investigation may now be summed up. The greatest distraction is that caused by the activity involved in summation, while the use of the organ of speech causes a smaller, but still distinct, disturbance. The effort required in tapping the table produces generally a certain disturbance: its effect however is neither so universal nor so distinct. These conclusions may be taken as proved by both methods; the negative method, in addition, shews that the most prominent factor in the weakened memory is the diminution in the number of letters retained. The average number of errors of displacement and of insertion is, on the other hand, smaller and remains for each group practically constant; relatively those errors take a larger place in the results of the first and second groups when we consider them in connection with the decreasing number of letters which are recollected.

There can be little doubt that the factor to which we must look in interpreting the results of the last three groups is that on which various psychologists have insisted, viz., the presence of a motor element in much of our mental activity. And in particular the loss of memory due to the effort of repeating a syllable in an audible voice while one is memorising seems caused by the fact that the reading or learning of any series of letters or words is accompanied normally by a more or less distinct articulation, this articulation being interfered with by repeating the syllable. To what extent our memory or associating processes in any case can act apart from direct or associated motor activity is a further question which cannot be

dealt with here. For the interpretation of the present results it seems necessary to assume that this motor activity plays a very large part in the formation of our associations. The full significance of this assumption can be seized only when we remember that what the subject is called upon to do in all cases is simply to read the series of letters, *i.e.*, to let the series of visual objects which are presented to him impress themselves on his memory. Apart from experimental evidence one might suppose that a series of visual objects would associate themselves together as well as any other series of perceptions or sensations. But, as we see, when the reiterated articulation of a syllable obstructs the further innervation of the articulatory mechanism, the memory is much worse than it is where no distraction is present, and where the unskilled observer would detect no process other than that of simple reading. Such a result indeed is only a confirmation of the fact already ascertained by Pathology of the close connection between sensory and motor activities, and in particular between the understanding of words and the ability to articulate them, or in some other way give to them a motor expression.

These theoretical considerations are amply confirmed by the observations contributed by the subjects. They insist that a distinct and embarrassing obstruction is felt when they attempt to read over the series of letters, an obstruction which is specially marked at a point where a letter such as *z* stands, whose pronunciation is unusually difficult. They see the letters and realise them distinctly as visual objects, but are at the same time impressed with a sense of their inability to connect the letters and form them into a series which can be remembered. And they notice how in the intervals of audible articulation the attempt is involuntarily made to insert an inaudible articulation, to employ *Bewegungs-antriebe*, which shall help to form the letters into a connected whole.

An additional support is lent to this explanation by a consideration of the data presented by the third group of experiments. The object of this group was to allow of a comparison between the motor activity of the vocal organ and that involved in the use of a set of muscles not directly connected with any mental operation. That an exact comparison is hardly, if at all, possible is plain from the fact that we must in any case employ two quite different groups of muscles habituated to different functions. Apart from theoretical exactness however, a basis for comparison may be got by observing what effect activity of the vocal mechanism has as compared with that implied in moving the forefinger. Possibly the act of saying '*do*' or '*la*' is more complicated than that of moving

the forefinger; yet after all a very considerable degree of facility in executing more complicated vocal movements must be granted to most persons. We may then assume equivalence between the two kinds of movements to this extent at least, that regarded physically the energy expended and the effort of innervation required in the two cases are fairly similar.

In almost every instance mere muscular movement produces less of a disturbance in memory than does activity of the vocal mechanism. And the reason for this is evident: the articulatory innervations involved in memorising are most conspicuously interfered with by conflicting activity of the vocal mechanism. The observations made by the reagents are only a concrete expression of this statement: what they notice in the experiments of the third group is a conflict of two motor series such as, for example, is involved in the effort to play on a musical instrument when one hand is required to move in a time different from that of the other. Had the reagents been able to render the two series coincident, and make the rhythm of the finger movement the same as that of the articulatory movement, then the difficulty would have been lessened, and one impulse or innervation would have served to carry out both movements. But owing to the arrangement of the experiments such coincidence would have made the learning too fast or too slow; too fast if a whole line was to be gone through at each stroke of the metronome, too slow if only one letter was to accompany each stroke. In some cases indeed the observers seemed to find a help in the rhythm of the finger movements; when they succeeded in combining the innervations for articulation and for movement an added emphasis was lent to the letters, which seemed to help in fixing them in the memory. It is evident however that experiments directed to the isolation and direct proof of this fact are needed before anything definite can be said.

If the series of letters presented to the reagent were associated as visual objects, then it would be still more difficult than in the experiments of the second group to understand why an indifferent muscular activity, such as that of the hand, should interfere with the associations. It may be said that this activity implies a certain degree of inattention to the letters presented, and no doubt this is true. But the diminution of attention must have been very small; there is a distraction, but it is almost wholly a distraction of the motor mechanism. And it is important to distinguish here between these two things, predominance of a state of consciousness or attention, and that state or attitude of mind which we term activity. In many of its manifestations, and here in particular,

psychical activity, so far as it is a factor different from mere movement of ideas, seems intimately connected with some form of function of the motor system.

According to the testimony of more than one subject, the disturbance caused by the finger tended to disappear in proportion as the effort required to make its movement keep time with the beating of the metronome became more automatic. This would mean that the two motor series conflict and compete with each other only so long as they both remain in direct connection with conscious experience: two disparate activities on the other hand can be carried on simultaneously if one at least be automatic, or carried on apart from our ordinary consciousness. Binet concludes, as the result of an experimental study of such questions[1], that an automatic movement is able to coexist with a voluntary movement because it is not preceded by a conscious mental representation, and consequently does not involve conflict of ideas. This it is obvious is not an explanation, but simply a restatement of facts: why two conscious series of ideas must conflict is not explained either psychologically or physiologically. The theory, that inability to attend effectively to more than one series of ideas is due to a limitation in the available psychophysical energy, does not seem at all convincing, but what should be put in its place is by no means equally clear.

It will be observed that while, with regard to the majority of the observers and the average of the results given by all the individuals, the value of memory shews a diminution in the experiments of the third group as compared with the fourth, yet divergencies occur. For this fact various explanations are available. Apart from accidental variation in the results, which is not a probable explanation, there will evidently be a difference in the effect of these distractions upon memory according as the subject is of a motor, a visual, or an auditory type. I feel inclined to believe that this is partly the explanation of the irregular results of He.; this individual was particularly emphatic in his statements as to the prominence of visual images in the process of reproduction. How far this explanation can be carried is however doubtful; I tried to ascertain from the subjects what their usual kind of imagery was, and to relate it with the results, but was not able to find any definite connexion: to establish such a relation it would be necessary to ascertain by direct experiment to what extent and in what relations the imagery conformed to the different types.

[1] *Revue Philosophique*, XXIX., "La concurrence des états psychologiques."

Another explanation may perhaps be found in the fact that the reagents were left entirely free in their method of learning; they could learn the series slowly, or they could run over the letters quickly and often: especially in the fourth group was there scope given for the varying preferences of the individual. In the other groups the subject, it is plain, had to memorise not so much as he wished, but as best he could. These individual variations may take shape also in another form; according to his momentary disposition he will tend to spend greater or less energy in learning what is presented to him. And apart from this general variability there are the differences which arise from the fact that, as the experiments were actually arranged, a severe distraction alternated with one less severe, or with a state of freedom from distraction. The subject will obviously feel relieved when an easy task is put before him; this however leaves it quite undecided whether he will shew this feeling of relief in memorising much better, the energy expended being the same as before, or whether he will unconsciously with the removal of the difficulty lessen the intensity of his efforts and, sure of learning in any case more than before, will content himself with memorising less vigorously. These divergencies, it is plain, furnish the point of departure for further research and exacter analysis. In particular it would be desirable in a more advanced stage of this research that the conditions of experiment should be altered so that while becoming more artificial, they would still in the end be more precise. A greater similarity in the method of learning would in part be secured by the adoption of a method like that of Müller and Schumann, which secures that each object shall be presented to the reagent in an order and for a length of time which can be exactly regulated[1].

In order to facilitate the analysis of the various phenomena I have begun by discussing the nature of the processes involved in the experiments of the last three groups. It is however only in the first group that we have facts bearing directly and immediately on the phenomena of attention. In fact the three last groups were arranged in order to analyse and illustrate the factors that are involved in the processes of the first group. That we have in this group a real disturbance of attention might be supposed on theoretical grounds; that such a state of mind actually resulted from the experimental conditions was

[1] The series of meaningless syllables used in their experiments were written on sheets of paper; these were fastened on a cylinder which rotated at a known rate and shewed the syllables in succession to the reagent, who was looking through a slit in a screen set before the cylinder.

asserted by the observers. The movements of speaking, said K., one of the most skilled observers, do not become more difficult in the fourth group; what the addition does is to diminish the energy available for learning.

Here again, as in the relation between the second and third sets of experiments, it is not possible to effect an exact comparison between the effort of articulation in the second group with that implied in the repeating the series of numbers audibly. The words uttered in the course of the addition differ with each stroke of the metronome: towards the end of the period of memorising words of more than one syllable are involved. As regards the first point, it is not probable that the effort of repeating different but perfectly easy and well-known words is much greater than that of uttering the same syllable over again. That as the addition progresses we have first words of two syllables and then two or, at most, three words of three syllables, is a more important consideration. The reagents however used constantly a device which minimised the difficulty; emphasising only one out of the two or the three syllables to be spoken, they allowed the voice to die away in pronouncing the rest of the word, which thus formed a sort of indistinct sound or *Nachklang*. That this diminished intensity of articulation greatly diminished the amount of disturbance otherwise involved seems clear from the cases where the reagent, while attending too exclusively to the work of memorising, allowed the voice to die away and ceased to speak distinctly, thus increasing his power of memorising. The only data of an experimental kind available for the confirmation of this account of the matter are those gained in the course of various tentative experiments. The purely vocal disturbance was in these experiments brought about by pronouncing in their order the series of numbers 1, 2, 3,..... So far as these experiments go, their results correspond very closely to what is found when it is a syllable that is pronounced.

Simple as the act of addition may seem, the effort required to combine it with the process of memorising was extremely difficult—"painful" was the term applied to it by one of the subjects. For its effect was to make it almost impossible to do more than stare in a helpless way at the different parts of the combination of letters presented. The reagent was conscious of the presence of the visual objects, but it was as if their meaning was lost and he was unable to grasp the letters as anything more than mere signs, as if part of their content was wanting. Accompanying this state of mind was a feeling of helplessness, and a conviction of the uselessness for the purposes of learning and recollection of this merely visual consciousness of what was

presented. According to one observer it was during the earlier and easier stages of addition that memorising was really possible: according to others the opportunity for grasping the connection of letters presented itself in the pauses between the beats of the metronome, or at the close of the time of exposure[1], when it seemed possible as it were to snatch part of the series and give it a moment's concentration. In this way short groups of letters, small pictures, could be impressed on the memory, and in this way the full effect of the distraction was not felt; the attention oscillated, so to speak, during the process of memorising. In any case however the total attention together with the ability to reproduce larger groups and a connected series was much lessened. How low the value of the memory would have sunk had the state of distraction involved in each separate step of the addition been maintained uniformly throughout, it is difficult to say.

Reference has already been made to the fact that as we pass to the second and then to the first group, the number of errors of insertion and of displacement increases relatively to the number of letters actually remembered. As regards errors of insertion this statement seems justified, in spite of considerable variations. But in any case this kind of error is not of great importance in comparison with the errors of disorder: they shew with considerable clearness and persistency an increase from the fourth group to the first. The effect of mental distraction may then be said to consist not only in lessening the total area of consciousness available for the reception of new impressions, but in confusing the recollection and thus lessening the power of forming exact associations, which shall enable the reagent in the first place to locate definitely what has been impressed on his memory, and secondly to exclude ideas which did not form part in the complex first presented to him.

In his research on the Association of Successive Ideas, which has already been referred to, Münsterberg comes to the opposite conclusion. In these experiments, which were carried out in order to answer the question whether association through mere succession was possible, letters forming series of varying length were successively presented to the subject. Some of the series were learned with full attention; others had to be learned while at the same time he was carrying out in an audible voice complicated arithmetical operations. The distraction of the attention lessened the number of letters which could be

[1] The latter fact was noticed only when the electric light was employed. It is difficult to say whether it was illusion, or was due to the circumstance that the cessation of light in the incandescent lamp is not quite instantaneous.

retained; according to Münsterberg it could not be the reason why in series including only four or five letters the right letters almost without exception were reproduced, but at the same time were given in wrong order. The real reason lay, he contends, in the exclusion of any opportunity for association by simultaneous contiguity. "The only possible effect of the greater or less amount of attention devoted to the perception of single letters is to cause them to be impressed more or less firmly on the memory."[1]

That the main conclusion regarding successive association—viz., that apart from simultaneous association or connections formed by means of the motor mechanism, it has no existence,—is rendered probable may be granted. But it does not follow either from the theory or from the experimental results that the only effect of inattention is to lessen the number of ideas which can be retained; in fact the suggestion that variation in attention can vary the intensity or completeness with which ideas are "impressed" on memory, without at the same time thereby altering the intensity or strength of the associative bonds between them, seems somewhat improbable. And as regards the actual results obtained in Münsterberg's research there is room for the working of all these factors; the greatest share in the disturbance of order may be due to the cause he suggests, but part also may very well be due to the two factors in attention; inattention or distraction may cause fewer ideas to be recollected, and may lessen the strength with which these are held, but it may also diminish the security and firmness of their associative connections. That it does so is rendered highly probable by the results which have already been brought forward in this paper.

The words Attention and Memory have been used throughout these pages as if they corresponded to definitely and generally accepted conceptions. Practically we know quite well what attention is, though the theory of the matter may be hard enough. It will be most profitable here to avoid theories and simply state what view of the function of attention seems most appropriate to the facts which we have been considering. The facts relating to attention are, as we saw, furnished mainly by the experiments of the first group. And the chief fact we found to be that inattention not merely lessened the extent to which ideas could be taken up and retained in consciousness, but in a still greater degree confused and deranged the associative connections in what was actually recollected. This again is simply the objective expression for

[1] *Zeitschr. f. Psych.*, I. p. 105.

the subjectively felt inability of the reagent to apperceive and relate what was presented to him. Through the process of mental distraction, said one of the observers, *Wahrnehmung* was turned into *Empfindung*.

It is in this that the essential operation of mental distraction seems to lie. In ordinary attentive experience each impression, each idea, as it occurs, is met and transformed—to speak in Herbart's language—by a mass of apperceiving ideas which render it known, familiar, recognised, and in doing so relate and associate it with similar experience we have had in the past. It is this mass of apperceiving ideas which enables us so easily without conscious or voluntary reflection to follow and understand some new fact in a science with which we are familiar. And in distraction of the kind we are considering the really effective element seems to be an inhibition of these associative processes which enable us unconsciously to relate and recognise what is presented to us, the effect of this inhibition being to produce temporarily a state to which one may apply the term *Seelenblindheit*. How far these processes are in any case represented in consciousness is another question; probably here, as in many other relations, apperception is to be understood as referring simply to the total indefinite state or attitude of mind, "the feeling of tendency" resulting from the minimal excitation of certain "ideational centres." The essential fact in attention on the other hand would lie, apart from its accompaniments, muscular adjustment and the like, in the strengthening of an idea or impression by the processes of blending and redintegration, those processes which are operative in all learning and knowing: attention on this view of the matter would be knowledge in its most perfect form, that form being attained not merely by positive support and strengthening, but by an inhibition or repression of all that might compete with and distract energy from the apprehension of what is attended to. There do not seem positive reasons, either theoretical or experimental, to forbid the hypothesis that there are degrees of clearness and distinctness in mental states: it seems however equally impossible to prove that an apparent increase in the clearness of an idea or sensation is an independent special process[1], and

[1] In a paper "Über die Schwankungen in der Auffassung minimaler Sinnesreize," *Phil. Stud.*, VIII. p. 365, Eckener asserts that a stimulus can still affect consciousness though quite unperceived and "dark": his proof consists in the observation that when a minimal sound stimulus has become subjectively inaudible, the reagent is still in many cases able to tell when the source of sound is objectively interrupted. That this proves nothing in regard to degrees of clearness in ideas is evident when we

not an illusive appearance due to some change in the associative or emotional complex surrounding it.

When we speak of memory as being a storehouse for ideas, of psychical states impressing themselves, being retained and last of all reproduced, we are using metaphors which are adequate for all practical purposes, and which are about as true as the theories often brought forward as giving the real truth of the matter. On this subject Physiology seems a better guide than Psychology, for Psychology has been too much burdened by its theory of ideas, and by its conviction that the elementary and fundamental psychical processes must be explained in terms of the developed mind. Physiological memory means simply that a given nervous centre has been so changed—how we do not know—by the occurrence in it of a certain set of processes, that when one of these occurs again the others tend to follow. It does not occur to anyone to say that the old processes are reproduced, and that physiological memory is inconceivable unless we suppose that numberless old innervations fuse with a new one, when that new one occurs, and so enable it to start a series of movements over again. But it does occur to psychologists, and is confidently asserted, that such a fusion of old and new is one of the fundamental associative processes. The physiological account of the matter is simple and natural: old psychical states are no more reproduced than are physical states, but similar states are reproduced; these in their turn tend to recall other states, which again had something like them in past experience. The fusion of old and new which occurs in organic memory means that owing to habit or repetition of an experience the physiological processes have become changed: they are modified owing to what has gone before, so that a fresh reaction is correspondingly modified. There seems no reason why, when we speak of storing up and of reproduction of ideas, we should introduce anything more into the processes than we would require were we to apply like metaphors to purely physiological memory.

According to the usual statement of the Law of Association by Simultaneous Contiguity, objects or ideas which have once been present together in consciousness tend in consequence to recur in the same connection. It is obvious that in such statements emphasis is laid on the fact that the ideas have been simultaneously elements of a conscious state, and that the process is one concerned solely with sensory or intellectual

remember that cessation of a stimulus physiologically may have for its first effect an increase of the reaction; e.g., in experiments demonstrating the electrical response of the frog's eye to light, the first effect noted when the light is withdrawn is an *increase* of the response.

experience. Observations made during the course of this research give occasion for some remarks on these two points.

It was pointed out again and again by the reagents that mere perception of a number of letters, mere presence together in consciousness, was useless for the purpose of associating and learning; that unless they were able systematically to go through the series at a moderate speed and with a fair amount of attention, no abiding impression was left on the memory. And the remark suggested by these observations is that those factors which form the real constructive basis of associations are such as are usually recognised merely as helps and supports to a connection which is due to simultaneous apperception. Interest, Attention, Repetition are recognised, though only as modifying factors, as influences which contribute to the efficacy of contiguity. But it is obvious that Interest in itself has no necessary connection with and is not implied in contiguity: Attention again is a factor which as we have seen is of great importance in the processes of associating and recollecting ideas; but that too is not implied in the description commonly given of the nature of association by contiguity. And, so far as the need of Repetition, Exercise, Habit for the formation of firm associative connections is emphasised, it is admitted that mere simultaneity is of little avail. It may well be that the method of entering into one's breast and observing what happens in the play of ideas whose connections have already been formed, has been the reason why a description which applies to so many of our actual associations is taken as a statement of the law of their formation and growth: that description is here taken for explanation seems in any case to be the fact. Ideas which are associated have very often been contiguous;—on the other hand ideas which have been merely contiguous are in the vast majority of cases not associated. Contiguity is indeed a formal characteristic which associated ideas possess: it seems necessary that ideas should form parts of one conscious state before they can be associated. It is however in these dynamic factors, Interest, Attention, Repetition, that the real causes, the formative influences, are found; it is this which should form the matter of any law intended to state the nature of the processes by which our actual associative connections are built up.

The second set of facts points to the need of emphasising, in our account of Association by Contiguity, the part played by the agency of the motor system. That habitual activities, or any acquired physical ability, illustrate the operation of contiguity has long been recognised. But in order to understand the formation of associative connections in the more purely

sensory or intellectual sphere, it seems necessary here also to seek an explanation in the functions of the motor mechanism. How that operates may not be clear; the subject, whose importance has been recognised perhaps most by Bain, Stricker and Münsterberg, has not been studied with sufficient exactness either psychologically or physiologically. But this factor offers itself without straining as a reason why visual objects presented in succession should refuse to relate themselves as members of a series when the help of articulatory innervations is withdrawn, and why the reagents in these experiments insisted so strongly on the necessity of going over the letters serially and systematically, and on the great hindrance caused by disturbance of the vocal mechanism. These facts it would seem cannot be explained except by supposing that, as purely sensory objects, the associative tendency of the presentations was much less strong than where the reagent was left free to combine both sensory and motor elements in the process of memorising. And, if this be so, it will only be the psychical expression for the conviction which is gaining ground in Physiology that there are no purely sensory nervous centres, but that what bears this name really subserves a double function.

Münsterberg, in the paper from which I have already quoted, states that no special or predominant type of incorrect order was detected in the answers which were given in his experiments. Bolton[1], experimenting on school-children to whom he read over lines of five to eight figures, found that among the errors that of inversion was prominent. Errors of inversion were not infrequent in the experiments already described; still the number was not at all remarkable. Another type of error which occurred fairly often is more interesting; it consisted in letters changing their places in the lines so that, for example, the first letter of one line would take the place of the corresponding letter in another, this second letter then occupying the place of the first; in another instance the first letter of the last line is followed by the second of the middle line, by the third of the last line, and then by the fourth of the middle line. Whether this is to be interpreted as a disarrangement of a visual picture it is impossible in the absence of direct experiments to say. The question still waits solution, what sort of error is committed when each element in memory, visual sensations, auditory sensations and so on, is isolated and its capabilities tested. To such a task the method applied in this investigation seems specially fitted.

[1] The Growth of Memory in Schoolchildren. *Am. Journ. of Psych.*, v. p. 363.

The number of cases where similar letters were confused was too great to allow of the supposition that the confusion was due to accident: it was however not great enough to allow of a definite account of this tendency. Letters similar in sound, such as *m* and *n*, or *t* and *d*, were interchanged: similarity in shape seemed to be the reason why *h* and *k*, *u* and *v* were confused. It may well be that with such letters as *t* and *d* the reason of the interchange lay also in the easy transition from the one position of the vocal organ to the other. What letters are most liable to confusion and what disappear most readily, together with the relation of these facts to the phenomena of aphasia[1], are matters of interest, but can be studied only by extended and precise experiment. A series of experiments was begun to test what effect audible pronunciation of the letters to be learned had upon the memory: it was however only carried far enough to shew that probably very great individual differences exist in regard to the help or hindrance which such express articulation occasions in the effort to memorise.

It is plain that one great drawback in the results gained first by Ebbinghaus, and next by Müller and Schumann, in their investigations on memory, is that the work of memory is formulated in terms of time only, and that a qualitative analysis of memory is still to seek. It is obvious that results into which visual, auditory, motor and other elements enter as unknown, though probably relatively constant factors, can form only the first step in an account of memory. We have still, as was pointed out before, to find out the capabilities of these various factors and to shew further what changes they undergo in the gradual decay of memory. A few observations regarding the various factors may be adduced from the foregoing experiments. In the experiments of the last group the memory image seemed to be a somewhat indefinite complex of various factors: as the distracting activity became more difficult, and the aid given by articulatory innervations grew less, the observer had to depend more and more on the visual consciousness. Auditory ideas, as is intelligible, came little into play: they were indeed said to be present, but it is doubtful whether sensations connected with the organ of speech were not mistaken for them, a confusion which seems particularly easy when the two elements are present only in imagination or memory. Motor elements seemed to be present in the process of learning wherever they were not expressly excluded: it was they that lasted longest and enabled the

[1] It might be possible also to establish some relation between such changes and the philological facts embodied in "Grimm's Law."

reagent to recollect when the other sensory images failed. It is not without interest to note the different modes of reproduction of these elements. Whereas with the sensory memory the reagent seemed expressly to perceive and recognise each successive idea that appeared in consciousness, the process in motor memory was automatic or mechanical. The reagent pronounced the letters because an impulse to speak presented itself; often the appropriate movements came one after the other without thought or reflection, and without their being recognised as forming the required elements in the complex that was to be recollected[1]. In some cases what was retained in memory was only a vague general idea of the geometrical shape of the letters—their curves or straight lines—which on reflection might become more definite: in other instances there seemed to be a sort of vague idea of the spatial arrangement of the letters without any definite observable images being present. It often happened that, when the reagent believed himself to be in full possession of a line and ready to repeat it perfectly, he was yet unable when the time came to reproduce any part of it: to his surprise the line simply disappeared. Apparently this often happened while he was engaged in repeating the first letters: during this effort the rest of the memory image seemed to be driven out of consciousness. What the conditions of such a belief and its subsequent effects are, could not be exactly determined: according to one observer K. the basis was a *Gesammtvorstellung*, a sort of all-embracing complex idea in which the parts have an indefinitely felt unity.

[1] Observations of similar phenomena are given by Müller and Schumann, *loc. cit.* §§ 23 ff.

V.—SIMPLE REACTIONS.

By E. B. Titchener.

The simple reaction-time is the interval elapsing between the mental "receiving" of a sense-impression and the execution of a movement in response to that impression. Its consideration has of late occupied a somewhat prominent place in psychophysical discussions. I propose here, first, to make clear the reason of the controversies which have arisen round this simplest question of mental chronometry; and, secondly, to attempt the proof that the matter at issue is really of psychophysical importance, and that the final settlement of disputed points is for many reasons scientifically desirable.

(1) Ludwig Lange, working in Wundt's Institute at Leipsic in 1886–7 found that the duration of the simple reaction was appreciably different, according as the reagent directed his attention (so far as possible) exclusively upon the sense-impression or upon the movement to be made in response to it. Lange accordingly distinguished two types or forms of simple reaction, the *sensorial* and the *muscular*. He found also that a considerable amount of practice was necessary, if the reagent was to give each type in its extreme shape. Especially is there a tendency towards the shortening of the sensorial form by some intermixture of motor innervation: but the maximal degree of muscular preparation cannot either be attained all at once. The average difference between the two reactions is $0{\cdot}1'' = 100\,\sigma$.

This is the discovery which has led to so much psychophysical controversy. I proceed to tabulate the principal evidence for and against its validity.

(*a*) L. Lange: *Phil. Stud.*, IV. pp. 479 ff. *Sound* reactions. For three reagents, $m. = 125\,\sigma$, $137\,\sigma$, $123\,\sigma$; $s. = 223\,\sigma$, $224\,\sigma$, $230\,\sigma$. Difference: $98\,\sigma$, $87\,\sigma$, $107\,\sigma$. For one half-practised reagent, $m. = 147\,\sigma$; $s. = 192\,\sigma$. Difference: $45\,\sigma$. In the case of several (*zahlreiche*) other persons, altogether unpractised, the time-difference was found to exist without exception. Wundt quotes individual series of figures for *electrical-cutaneous*

and *light* reactions from the as yet unpublished continuation of Lange's investigation (*Phys. Psych.*, 4th ed. II. p. 311). *Cutaneous.* For one reagent, $m. = 105\,\sigma$; $s. = 213\,\sigma$. Difference: $108\,\sigma$. *Visual.* For two reagents, $m. = 172\,\sigma$, $182\,\sigma$; $s. = 290\,\sigma$, $291\,\sigma$. Difference: $118\,\sigma$, $109\,\sigma$.

(*b*) G. Martius: *Phil. Stud.*, VI. pp. 167 ff. *Sound* reactions. For two unpractised reagents, $m. = 130\,\sigma$, $172\,\sigma$; $s. = 179\,\sigma$, $242\,\sigma$. Difference: $49\,\sigma$, $70\,\sigma$. The practised results of one of these reagents and of the writer (p. 210) cannot be appealed to, as the conditions of reaction had been modified (p. 211). Even with the modification, however, which greatly curtailed the sensorial time (changing it to a 'central' type), the latter proved invariably to be longer than the muscular.

(*c*) G. Dwelshauvers: *Phil. Stud.*, VI. pp. 217 ff. *Sound* reactions. The tables of this observer are too lengthy to quote. I cite his summary: "The distinction drawn by L. Lange between the sensorial and muscular reaction.....has proved entirely valid throughout my experiments. The difference is so considerable, that the shortest sensorial time exceeds the longest muscular by $60\,\sigma$" (p. 229).

(*d*) Lange's discrimination of the two reaction types suggested to O. Külpe the thought that the quality of the psychophysical disposition would not be indifferent in the case of wholly automatic movements or coordinations. Hence arose the series of articles on the simultaneity of movement: *Phil. Stud.* VI. pp. 514 ff., VI. pp. 147 ff. (Part III. still to be published). Cf. the author's *Grundriss der Psychologie*, pp. 422 ff.

(*e*) E. B. Titchener: *Phil. Stud.*, VIII. pp. 138 ff. *Light* reactions. For three reagents, $m. = 178\,\sigma$, $181\,\sigma$, $182\,\sigma$; $s. = 260\,\sigma$, $266\,\sigma$, $279\,\sigma$. Difference: $82\,\sigma$, $85\,\sigma$, $97\,\sigma$. Seven participants in this investigation were found to be incapable of reacting with any degree of constancy: their results were therefore not employed.—Cf. *Am. J. of Psych.*, VI. pp. 242 ff. *Sound* reactions. Four observers showed the typical difference with the ordinary key. Of eight tested with the Cattell lip-key, one was not educable; two gave central times for sensorial; and one could not be relied upon for constant results. The remaining four showed the typical difference. Of six tested with the Dessoir finger-key, two were not educable, and one gave central for sensorial times. Three, therefore, showed the typical difference.

(*f*) J. McK. Cattell: *Phil. Stud.* VIII. pp. 403 ff. *Sound* reactions. For two observers no difference was found ($105\,\sigma$, $105\,\sigma$; $105\,\sigma$, $108\,\sigma$ or $105\,\sigma$). *Cutaneous-electrical.* For two observers, no difference ($142\,\sigma$, $142\,\sigma$; $119\,\sigma$, $121\,\sigma$); for one, the muscular time exceeds the sensorial ($281\,\sigma$; $201\,\sigma$; dif-

ference 80 σ)! The first and third reagents were practised.—Cf. *Psych. Rev.* I. p. 542, and I. p. 165 (no difference for two observers; muscular time exceeds sensorial for reagent mentioned above: all practised).

(*g*) J. J. van Biervliet: *Phil. Stud.* X. pp. 160 ff. *Sound* reactions. The results of eleven observers are communicated, all under the rubric 'sensorial.' Two sets seem really sensorial; five central; four muscular. The mean variation seems in every case to be sensorial. The reagents were apparently not practised at all in muscular reactions.

(*h*) J. M. Baldwin: *Senses and Intellect*, p. 113. "If the attention be fixed upon the reacting sense rather than upon the receiving sense, the time is shorter....This I found in my own experiments before seeing reference to N. (*sic*) Lange."

(*i*) M. Dessoir: *Arch. f.* [*Anat. und*] *Physiologie*, 1892, p. 311. Temporal relations of *contact* and *temperature*, and of the latter and *pain*. Of eight reagents, not one showed the sensorial-muscular difference. But the writer expressly states that they were not recommended to concentrate the attention exclusively upon impression or movement: "to react sensorially or muscularly" in obedience to such a recommendation "would be to react wrongly." "The true reaction stands midway between the two extremes." And the rubric for it (p. 312) reads just as does Martius' rubric for 'central' times. But if the observer is asked definitely for central times, it is not strange that he should avoid the sensorial-muscular extremes.

(*k*) C. B. Bliss: *Yale Studies*, I. pp. 1 ff. *Sound* reactions. One reagent, practised exclusively in sensorial attention. Particular efforts towards the muscular form reduced the time from 140 σ to 100 σ, and from 142 σ to 111 σ. "More often the time was lengthened. It seemed very difficult to overcome the habit of turning the attention toward the ear" (p. 38).

Here are ten witnesses. Six are positive; four more or less negative. But of the latter (*i*) is put out of court by his own evidence, and (*g*) and (*k*) by the fact that practice in muscular times had not been had. There are left the four observers of (*f*). Professor Cattell himself is so exceedingly practised a reagent, that one may suspect automatism in his case[1]. We have cases, again, in which the muscular time is the longer, recorded by Dr Martius[2] and Dr Bliss. The latter two writers offer an explanation of the phenomenon. Dr Martius refers it to the novelty of the stimulus, and the consequent inability to concentrate attention permanently on the movement. He has

[1] Wundt, *Phys. Psych.*, 4te Aufl. II. 316, 317.
[2] *P. S.*, VI. p. 409.

no doubt that with practice the normal relations of the two times would have been induced. To explain Professor Cattell's result we may adopt the theory that the reagent *D*[1] was naturally or by practice inclined to the sensorial type; supplementing it by the following hypothesis. It often happens that a beginner attends so strongly to the movement, that his hand is too highly innervated: the muscles become cramped, and the movement—instead of being experienced as a *Befreiung*—is more difficult and slower than in the sensorial reaction. This state of things can only be abolished by equalising practice between the two forms. Now plainly, a 'sensorial' reagent, turning perforce to the opposite mode, would be exceedingly apt to experience such an inhibition of movement.

Even the positive evidence, however, points to the fact that by no means every reagent showed the typical difference. On the basis of the whole, I have concluded that the distinction drawn by L. Lange is a valid one, but not obtainable from every observer. "Rather is there required for the work a special kind of disposition or *Anlage*".[2] Professor Cattell—the principal opponent of Lange's view, as we have seen—is a little amused at my '*Anlage*'.[3] He seems to have forgotten that the same point was made by Lange himself[4]; and has been since emphasised by Leumann[5], Külpe[6] and Wundt[7]. James, citing Buccola, suggests it[8]. Bolton has recently urged it very forcibly in a different connection[9]. So that Professor Cattell's sarcastic smile at Messrs. Hill and Watanabe must be made broad enough to include all these other investigators also.

(2) These, then, are the facts. I proceed to my second question:—that of whether the matter at issue is of any real psychophysical importance. To answer this question, it will be necessary to review in brief the functions of the reaction experiment in the science.

(*a*) The reaction is the simplest type of a voluntary action. It, therefore, is the material which must be employed in the teaching or acquiring of introspective control of this combination of conscious processes. (*β*) The reaction method has been extensively employed for the determination of the duration

[1] At the time of testing, *D* had reacted to about 2000 electrical stimulations, without knowing of the sensorial-muscular difference: *P. S.*, VIII. p. 406.

[2] *Am. J. of Psych.*, VI. p. 246.

[3] *Psych. Rev.*, I. p. 543.

[4] *P. S.*, IV. pp. 494, 495.

[5] *P. S.*, V. p. 631.

[6] *Grundriss*, pp. 422, 423.

[7] *P. P.*, 4te Aufl., II. pp. 312 ff., esp. p. 321. And *Vorlesungen*, 2te Aufl., p. 298.

[8] *Principles*, I. p. 94.

[9] Rhythm: *Am. J. of Psych.*, VI. pp. 208 ff.

and for the analysis of certain complex mental 'acts': cognition, discrimination, association, choice, etc. Thus, it has been called upon for proof that deduction is psychologically more difficult than induction. Subsumption takes less time than exemplification. To associate a word to a concrete impression occupies a shorter interval than to associate a concrete idea to a spoken name (Cattell, etc.). Other association laws have been confirmed by it: as, *e.g.* that the more immediate the temporal connection of two ideas is, the quicker it takes place (Trautscholdt, Münsterberg); or that the more nearly related an idea is to another, the more quickly does it connect with this other (Trautscholdt). As regards cognition, we have such important results as that the assimilation of a simple word takes no longer a time than that of a single letter (Cattell, Titchener). A fact of this description throws welcome light upon the 'mechanism' of mind. Again, the reaction method has been used, *e.g.* for the discrimination of degrees of tonal fusion. The minor third fuses less well than the major; the time of cognition of the former being constantly, though not very much less than that of the latter (Tanzi). As regards discrimination proper, we find that qualities are distinguished much more easily than intensities (Friedrich, Tischer): the reaction method thus justifying the psychophysical assumption that quality is the most 'absolute' attribute of a mental process, while our judgment of relative intensity is less ultimate, depending on a complicated chain of association. Lastly, that 'choice' takes time, over and above discrimination, is a fact of importance for conative theory[1].— On the quantitative side, we have the time-values of the simple and compound reactions, which we can apply as norms in any particular case. The shortening or lengthening of the simple time is correlated with certain pathological states of the nervous system (Kraepelin, etc.). The times of particular categories of association enable us to classify observers according to intellectual temperaments (Wundt, Münsterberg). And the duration of the reaction, once more, tells us whether a purporting association is a true association or an apperceptive completion (Titchener). (γ) It has been suggested that "a man's reaction will show the influence of his memory type," as visual, auditory, motor or mixed (Baldwin, Flournoy). I do not wish to undervalue this suggestion, in which there may very probably 'be something':—Professor Cattell genially alludes to it as the discovery of a kingdom, while my students' verification of the sensorial-muscular difference is a search for asses. But there will probably be difficulties in the way of the acceptance of the

[1] See Wundt, Merkel and Kraepelin, *P. S.*, x. pp. 485 ff.

criterion as universally valid. For instance, I have myself cultivated the visualising power to a high degree, and have learned in the course of extended cutaneous investigation to control it pretty thoroughly. Yet my visual simple (sensorial) times, as is shown by several tests, are not shorter than the normal; nor is my auditory reaction longer. The muscular times, in both cases, are also normal. (δ) It has been proposed to use the reaction-method for the determination of the duration of sensation. But the proposition has many difficulties, theoretical and practical, to contend with. (ε) Reactions afford one of the best and surest means of investigating the psychophysics of practice. "We may study by their help the effects of practice; and not only its effects, but its progress, its distribution in time, and the variations in it which result from the nature of the acts experimented on and the personality of the observer[1]." The same holds of fatigue. (ζ) Again, the reaction-method can be turned to account in numerous ways for the investigation of the attention: in other ways, *i.e.*, than in that which is now *sub judice*, and which cannot therefore be insisted upon. I need only mention such topics as the fluctuations of attention, distraction, etc. (η) While, lastly, the reaction is employed in astronomy (observation of stellar transits), in physiology (propagation of nervous impulse[2], ocular accommodation, etc.), and, as hinted above, in pathology.

M. Binet seems, then, justified in his statement: *La psychometrie est une méthode générale*[3].

Now why is the settlement of the sensorial-muscular dispute desirable? Let us take in order the functions of the reaction-method which have been just cited. First, training in introspection of action. It is clear, that if there is to be any guarantee of progress in introspection, the experimenter must have some control: things cannot be left entirely to the experimentee, who is to be educated. I have elsewhere attempted to show that the sensorial times furnish such a control, while muscular times do not[4]. I will not here repeat the arguments adduced: they are all taken from actual experimentation. If they hold, it is very desirable that the sensorial form should be especially practised. Note also, that in the opinion of those who accept the sensorial-muscular distinction, the change of time-value as answer to the command to vary the direction of the attention is proof that the observer has his voluntary attention so far under control.

[1] Binet, *Psychologie expérimentale*, p. 127.

[2] Partially discredited by Professors Cattell and Dolley; *Psych. Rev.*, I., pp. 159 ff., esp. p. 168.

[3] *Op. cit.*, p. 130.

[4] *Am. J. of Psych.*, VI. pp. 408 ff.

XUM

Secondly, analysis and temporal determination of complicated processes. It is clear, again, that the first step here must be the simple reaction. All compound forms imply and necessitate previous knowledge of the simple. When we ask which of the two forms is to be the basis of the further investigation, we meet with divergent answers. James says: "The 'extreme muscular method,' giving both the shortest times and the most constant ones, ought to be aimed at in all comparative investigations[1]." Wundt, while he admits the possibility of setting out from the muscular form, strongly recommends the employment of the sensorial[2]; and insists that the observer must be able to react with constancy in the two ways. Whichever view we adopt, this latter requirement must be made. For, on James' theory, the least complicated complication of the reflex reaction—that, *i.e.*, in which the simplest psychical elements are introduced—will be the sensorial. It, therefore, will be the next stage of practice after the muscular. And, on Wundt's, it is necessary (as stated) that the observer be able to react in both ways; since this is the only warrant that he can control his attention sufficiently to make it worth the experimenter's while to proceed with him to more difficult experimentation. This all from the qualitative standpoint. From the quantitative, as I have said above, the adoption of the one view or the other makes a time-difference of $100\,\sigma$ in the results accepted.

For the study of the psychophysics of practice, the separation of the two forms is highly instructive. The muscular reaction tends to become automatic and reflexlike; this tendency being very much weaker for the sensorial. So with fatigue; the 'muscular' fatigue, when practice has attained its maximum, is principally motor, the 'sensorial' mental.

Attention is debatable ground: and as I hope that my case is already made out, I will not enter upon a discussion of it. It will be readily seen that the comparative psychological value of a distraction, *e.g.*, cannot be estimated, if the reaction-form vary from individual to individual, or with the same individual at different times; even although (and for this we have found the valid evidence to be exceedingly little) the time-values should turn out to be the same in either case.

(3) The psychophysical importance of the controverted issue has now been set forth. I append as postscript a table of the introspective differences between the two forms of the simple reaction, as taught in the Leipsic Institute.

[1] *Principles*, I. pp. 93, 94.
[2] *Phys. Psych.*, 4te Aufl., I. pp. 362, 363; 344; 370.

Muscular.	*Sensorial.*
(i) Motor attention, expectation, assimilation.	(i) Sensory attention, expectation, assimilation.
(ii) Motor strain sensations.	(ii) Sensory strain sensations.
(iii) Reflexlike, spasmic movement.	(iii) Willed, slow movement.
(iv) Simple perception of impression, with previous act of will.	(iv) Apperception of impression, with consequent act of will.
(v) Premature and erroneous reactions.	(v) No mistakes.

The stages in the theory of the simple reaction, up to 1892, I have already discussed in *Mind*, N.S. I. pp. 216 ff. The more important publications upon the question since that time are as follows: Cattell, *P. S.* VIII., 403; Külpe, *Grundriss*, 421; Exner, *Entwurf einer physiologischen Erklärung der psychischen Erscheinungen*, I., 156. Compound reactions are discussed from the point of view of theory by Külpe, 425; Wundt, Kraepelin, Merkel, *P. S.* X., 485; and Exner, 160. Incidental contributions to theory are made in several of the papers cited above.

VI.—REALITY AND CAUSATION.

By W. Carlile.

PART I.

§ 1. *The criterion of truth in philosophical discussion.* To what criterion can we appeal as final in philosophical discussion? Is there anything that, in regard to Metaphysics or to what has lately been called Epistemology, occupies the position that Authority occupies in regard to Theology, Precedent to Common Law, or Experiment to Physics? There is, of course, the criterion of self-consistency. That, however, is only a criterion of sequence. We can show that a writer's conclusions do not flow from his premisses; but what about the premisses themselves? Is there any rule that we can apply that will be generally accepted as decisive one way or another in regard to their validity? There is, we find, one criterion that is frequently applied in the last resort, and often apparently with the tacit consent of all parties. This is the appeal to the natural use of language.

An instance of its application which has become famous, even outside philosophical circles, is that made by Mr. Mill, in his controversy with Mr Mansell, in connection with the question whether Goodness could be attributed to the Supreme Being in any other than its natural signification. "Language has no meaning," he says, "for the words Just, Merciful, Benevolent, save that in which we predicate them of our fellow creatures; and unless that is what we intend to express by them, we have no business to employ the words;" and the validity of the appeal was, in so far, acknowledged by Mr Mansell that, in his rejoinder, he found it necessary altogether to remodel his previous contention. Mr Mill, however, was by no means conscious of the possible universality of application of his own criterion.

Many other instances of the appeal will occur to anyone who has followed the course of any philosophical controversy. Mr Mill, for instance, in support of his view that what Matter really is, is that which resists muscular effort, points out that

resistance is the test which men of science[1] "who have no theory to support" use to decide whether such entities as heat and flame are matter or not. Professor Bain similarly asks, "Is not the real meaning of space simply room for movement?" in support of his view as to the true nature of that conception. When Hume urges that it is from invariable antecedence and from that alone that we derive the notion of Causation, Reid replies that, if that were so, we should call Night the cause of Day; and Mr Mill so far acknowledges the validity of this appeal to the use of the word Cause in its natural meaning, as to alter the definition of it from the "invariable antecedent" to the "invariable unconditional antecedent." It will be said, "Why, this is but the familiar method of trying a Theory by its application in an individual instance, which is common both to Metaphysics and to Physics, as well as to the affairs of practical life:" and so it is, but with this important difference, that what stands for fact in Metaphysics is the converse of that which stands for it in Physics or in practice.[2]

To take an example; when Hamilton and Mill both tell us that the vulgar think they see the sun, but the philosopher knows better; he knows that what he sees is only its image on the retina, and that no two people see the same sun, how are we to decide whether they or the vulgar are right? Open our eyes and look at it, or, to make sure that there is no illusion, turn to our neighbour, and ask him, does he see it? That would be the appeal to objective facts. But, of course, in that aspect, the proposition that we "see the sun" is not called in question. What is called in question then? Plainly, nothing but this, whether we rightly apply the word "see" to what happens. The facts are granted. The sole question that remains to argue about is the propriety of the application of the word. My contention is, that there is no possible criterion which we can apply to decide this question except the criterion of its common use. In the meantime, it may be said, in regard to this particular case, that if we define "seeing" as "having a visual sensation simply," then the philosophers are right; we do not see the sun. If, on the other hand, we define it as "having a visual sensation combined with inferences that localize and classify it," then the vulgar are right, and we do; and, as unclassified and unlocalized sensations belong to the region of the unconscious, it is quite certain that by the word "see" we cannot mean them.

[1] The appeal to "those who have no theory to support" occurs frequently in his pages. Cf. *Logic*, vol. i., ed. 3, p. 344 note, and *passim*.

[2] The difference between the two is the same as that between the point of law and the question of fact.

§ 2. *The proof of facts and the constitution of conceptions.* How the appeal to common use may be justified will be best seen by regarding the process by which an individual fact or thing is brought under a general conception, and comparing it with that by which the general conception itself has been, in the first instance, constituted. Suppose we are at sea, and there is land ahead of us; we wish to ascertain whether it is an island or not; we sail round it, and then decide that it is. We have here the conception of Island ready made to compare with the individual thing. Let us suppose ourselves, however, not, as yet, to have had this conception; how do we acquire it? We sail round the land and then give the name "Island" to such land as it—land that can be sailed round. It will be seen, then, that the process by which we prove that an individual thing comes under a conception is the very same process by which we have, in the first instance, constituted the conception itself; and, in this, I think, we have the key to the solution of many much-discussed problems. In the secondary instance, when we have the conception already formed, and have to compare an individual instance with it, there is room for doubt and argument. In the primary instance, where there is the conception simply standing alone, there is nothing to doubt or to argue about. If we take the notion of doubt which is applicable to the one, and apply it to the other, we do something analogous to that which is done by the wild-cat metaphysicians who take the notion of dimension from the three dimensions of space, and apply it to what they call a fourth, they, at the same time, attaching no meaning whatever to the words they use.

It may be said, though, of course, the notion of doubt has no application to the conception of Island standing alone, it has a possible application to the question whether the term "Island" is rightly applied to land that can be circumnavigated. Granting that it has, we ask in what other conceivable way is this doubt to be set at rest except by an appeal to the "convention that underlies intelligible speech." The word "Island" is rightly applied to land that can be circumnavigated, because mankind have agreed to attach such a term to land of such a sort. Similarly, the terms "Real," or "Object of the outward world," are rightly applied to those things to which mankind have agreed to attach them; and, further, in all questions raised in regard to them, there is and there can be no other issue at stake but the propriety of this application; and this issue can be decided in no other manner but by the appeal to their common use.

It will be said, "Are the questions raised in Philosophy then

only questions as to the meaning of words?" and I think we cannot escape the conclusion that an unsuspectedly large proportion of them are so. All of them that are known as Epistemological can be nothing else but questions of words. To decide whether any question is a question of words, or a question of fact, we may apply a simple test. We may ask, does its decision bring us any further ahead. When Hobbes urged that all motives of action were selfish, it was answered that, granting that they were so, then we must again divide these selfish actions into two classes, the selfish-selfish and the selfish-unselfish. Hobbes' contention was thus seen to have a verbal foundation only. The same test, if applied to the question, "Is all knowledge subjective?" would seem to show that this question is merely one of words, as, granting that all knowledge is subjective, we should still have to divide it into the subjective-subjective and the subjective-objective.

If, however, it is beyond dispute, as it seems to be, that the natural use of language may, in the last resort, be appealed to with general acceptance as the final criterion of philosophical truth, we are met with this difficulty—that the popular use of language is accused, and, beyond all question, justly accused, of being a fertile source of philosophical error. The fact that it can be, at the same time, the last criterion of truth, and a fertile source of error, presents a problem which seems to demand solution. The best way of approaching its solution will perhaps be to take some of the words expressive of elementary notions, such as "Reality," "Identity," and "Causation," and enquire what is their natural use, and how we can assure ourselves that it is both natural and legitimate.

§ 3. *The type instance of Reality.* It is quite certain, on the one hand, that no one can give us a definition of Reality, and equally certain, on the other, that all of us who use the word intelligently know what we mean when we use it. We can thus, it appears, know the meaning of a word without being able to formulate it, as we can play a tune without knowing anything of the theory of music. How, then, did we learn it, if not from a definition? By an object lesson. The denotation, it has been truly said, precedes the connotation of words. If I cannot define for you the meaning of "Reality," I can, at any rate, point out to you something that is real. Suppose, for example, that I say to you—a Galatea born yesterday—"This pen that I hold in my hand is real." The pen may thenceforth be looked on as, for you, the type instance of reality. All other things will be felt to be more or less truly real according as they embrace or do not embrace the attributes of the pen. Our first investigation into the nature of reality might therefore

properly take the form of enquiring what is it that happens when we thus first learn the signification of the word. In the first place, it is plain, there must be intercourse. The solipsist standpoint is wholly inadmissible. The sensations of an isolated being would never emerge into consciousness at all. Certainly they never would have names given to them. As to the nature of the intercourse in this particular case, there is, at any rate, this much that happens. There is a group of muscular and tactual sensations peculiar to me, as I grasp the pen in my fingers, accompanied by an auditory sensation simultaneous for both of us, as I say the word "Real;" then a group of muscular and tactual sensations peculiar to you, and an auditory sensation common to both of us, and recognized to be similar to the former auditory sensation, as you take the pen in your fingers, and repeat the word to show that you understand and concur. The nature of the muscular and tactual sensations have been perhaps adequately analyzed by experimental psychologists. I do not think, however, that this important difference between them and the auditory sensation has been explicitly pointed out, viz. that whereas such sensations as the auditory are open to the experience of an indefinite number of people at once, the muscular and tactual are confined to the experience of one at a time. You cannot hold the pen while I hold it—the same part of it, at any rate—without displacing me. This fact is, I think, the foundation of the distinction between the primary and secondary qualities of matter. It is that which subsequently becomes elaborated into the thought that two bodies cannot occupy the same space at the same time. On it is based the very possibility of the denotation of words, of pointing out anything. The ultimate meaning of the words, "The same thing," as between you and me, is, "The thing that I now lay my finger on, and that you cannot lay yours on without displacing mine." If you could, your finger would occupy the same space that mine occupies at the same time. As vision is a compound of muscular and colour sensations, it holds, in respect of this peculiarity, an intermediate position. I can see a face without displacing you, but not a face strictly in profile while you see it strictly in profile. As a result of this, pointing out, as a means of indicating, comes to be substituted for touching.[1]

If intercourse is necessary in order that the very conception of reality may be built up, it becomes evident that we do not

[1] Though, in my example, I left Vision out of account, for the sake of clearness, and because the notion of reality is as easily attainable by the blind as by others, it is really Vision that, in virtue of its double character, is continually bridging the gulf between us, and as continually constituting the conception of "Object" and "Reality."

get our certainty as to the existence of the external world by a flash of intuition, that it is not what is called a datum of Consciousness. Indeed, a moment's reflection on the nature of Consciousness is of itself enough to make this evident. Consciousness is a thing of the instant. As soon as we reflect, it becomes memory, and no one has yet claimed infallibility for memory. Between the occurrence of any sensation and its reproduction in Memory, there is room for Illusion to step in. The truth is, that we reach certainty about these elementary matters as we reach certainty about any other fact, by cumulative proof; though we do not think of it as "proof" while it is building up the conception, but only when, by the very same process, it is bringing individual instances under it.[1] The conception itself is a complex one. It implies, in the first instance, at any rate, tangibility, as well as the fact of being the subject of the concurrence of others. In respect of this latter element, identity is involved in the meaning of Reality. Inner states, says Lotze, cannot, like material things, be "separated from their original possessor and passed on as they are from hand to hand." It is in this capability of being passed on from hand to hand that both "objectivity" and "identity" primarily consist. I know that a colour or a sound is one thing to me, and another more or less similar thing to my neighbour. How, on the contrary, do I know that an inch measure is precisely the same thing for him as for me? The explanation does not lie in any peculiarity of the primary sensations caused by the inch measure. I could have no assurance, from the nature of the sensations that it produces when pressed against my palm, that they would be, in any sense, the same as those which it would produce if pressed against your palm. Indeed, I might be quite sure that they would not. In what, then, does the sameness consist? In the fact that the measure occupies the same space for you as it does for me; and that, in its ultimate analysis, means simply this, that you cannot hold it in your hand while I hold it in mine. Once we have got the length of finding things which are the same as between us, measurement becomes possible, and thenceforward all accurate quantitative knowledge.

That we get nothing that can properly be called knowledge from intuition is further clear from this, that an intuition is one,—is a unity,—while "knowledge," "belief," "truth,"

[1] This would coincide with Professor Jones's opinion, that "we have no certain fact to begin with" (*Mind*, p. 469). Though when he says that "certainty is only to be found in a consistent view of the world as an organic whole," we ask, "Are none but philosophers certain about anything?"

"certainty," and so on, consist in the correspondence of two things. We may have anticipations *a priori* such as the dread of the monkey for the snake, but we do not call them knowledge till they have been compared with fact and ascertained to be correct. "Having been compared with fact," is, I think, part of the connotation of the word knowledge; and if so, knowledge *a priori* or synthetic propositions *a priori* are nothing else but contradictions in terms.

§ 4. *The extension of application and attenuation of meaning.* There are some other aspects of "Reality" in its full and typical signification to which I will revert after some brief analysis of this notion of Causation. In the meantime, it may be well to draw attention to the successive transitions of signification which it, in common with very many other words, undergoes. It has been pointed out with regard to the word Acid that, "as experimental discovery advanced, the substances classed with acids have been constantly multiplying, and by a natural consequence the attributes connoted by the word have receded and become fewer." Putting the advance of early knowledge for that of experimental discovery, all that follows is as true of the word Real as it is of the word Acid. We began with the type instance of an outward object which gives us our ideal of Reality, embracing the element of tangibility, as well as that of being the subject of the concurrence of others. We apply the conception next to a sound, to distinguish a real from a fancied sound, and then we have to drop the first element, the tangibility. The full meaning of Real now becomes something given by sense in the existence of which others concur. We may apply it next to the objects of the outward world when not seen, heard, or felt by us, to the flowers that are born to blush unseen, to the world in the ages antecedent to Consciousness, and then we have to drop so important a part of its connotation that the applicability of the word itself becomes a matter of dispute—the great dispute of philosophy. Or, regarding the transition in another direction, we come to the region of the unconscious, to the sensations of babyhood and the lower world, that leave no trace, not even the faintest, in memory. *Unrealized* sensations we naturally call them. They are hardly distinguishable from flat nothing, yet undoubtedly they exist in a sense, as without them nothing else would. Reality, it seems, then, must be regarded as having different degrees, and shading off from full and typical existence into that which can hardly be distinguished from nothing at all. Even an hallucination may in a sense be called real. When Professor James therefore speaks of Reality as being a matter of the point of view; of the reality of the world of sound and light, as being kicked out, for

the man of science, by the reality of the world of vibrations and undulations, it is of some secondary meanings of Reality that he is speaking. Doubt in regard to them has really nothing in common with the Humist doubt as to whether the type instances of Reality are themselves real.

This extension of application and accompanying attenuation of meaning in these elementary words, points out to us where to look for the solution of the problem with which we started, viz. how the natural use of Language can be at once the criterion of truth and a source of error. We shall find, I think, that, when the meaning of the type is in question, language is justly reckoned the last Court of Appeal. Where it misleads the unwary is when he approaches the borderland where the applicability of words is doubtful.

§ 5. *Transition from literal to metaphorical meaning.* I have said that the course which such a word as Real runs is analogous to that which such a word as Acid runs. There is an important difference, however. Acid is, at any rate, always used literally. "Real," "Thing," "The same," "Cause," and such like words, very early in their history, jump from a literal to a metaphorical meaning. I can find no other word for it but metaphorical, though the metaphor is on the part of everyone unintentional, and of most unrecognized[1]. All the facts of the mental world are at bottom thought and spoken of by means of metaphors taken from the material world. One result of this is, that the process of the extension of application in respect of these elementary words is not merely a process of attenuation of meaning, but often rather of the substitution of quite another meaning for the original one. The reality of the truths of Geometry and Ethics, for instance, has only this in common with the reality of outward objects, that both are contemplated as subjects of general concurrence; and this element, it must be observed, the metaphorical realities possess in a higher degree than the literal. Hence arises this remarkable result, that the metaphorical meaning tends to supplant the type meaning as our model of reality; and hence the Idealists, from Plato to Lotze, are able to contend that there are entities more real than the things of the outward world. Such a mode of expression puts in an impressive light the permanency and universality of such conceptions as those of Straightness or of Justice. It is rather, however, the language of poetry than of science. Scientifically there can no more

[1] The result of the law of which Hume makes so much, that we can have no "idea" i.e. no mental image, that is not a reproduced sensation, together with the fact that we are under the necessity of doing our thinking, as far as possible, by means of mental images.

be things more real than those from which we derive the conception of Reality, than there can be things more human than a man, or more canine than a terrier.

All this happens even more conspicuously with regard to the word "Same." A young child takes every man for his father, every horse for the first horse that he saw, and so on. Hence the meaning of the word "Same" very soon becomes extended from continuous occupation of Space to undiscernible similarity[1]. When again the metaphorical transition takes place, we find that all these metaphorical things that we call abstractions, such as Blackness and Straightness, possess the character of undiscernible similarity with themselves at all times in absolute perfection. Hence it comes to be consciously contended, or oftener, unconsciously assumed, that their identity is the only true identity. If we say that it is so, we must at any rate keep it clearly in view that what we mean by identity as applied to them is something altogether different from what we mean by identity as applied to outward objects.

§ 6. *The denotation and the connotation of Everything.* It is clear that all words that denote Everything must have the same connotation. If, with the Pantheist, we say that God is everything, we must say that God, in some of His manifestations, is inert, that He is stupid, that He is malignant. If, on the other hand, we say that Matter is Everything, we must say that Matter is, on occasion, living, that it is intellectual, that it is benevolent. So, if we start from the conception of the world as a current of ideas, we know that there is still a world, and these ideas must possess all its characteristics. Hence the history of Philosophy since Hume has, for the most part, taken the shape of continuous attempts to square this conception with the facts of life. Hence in England, Mill's conception of an Ideal world as one of possibilities of sensation like fire which, in our absence, melt other possibilities of sensation like wax, is very much more like the Real world than Hume's conception of a procession of more or less vivid mental images. In Germany, Lotze, putting "Matter of Ideas" for what we used to call "Object," proceeds to construct a Universe to which little exception can be taken except that it is considered to be symbolic of something else. The modern

[1] The problem how it is that we come to conclude from particulars to a universal finds its solution in this, that we predicate at first by mistake everything that we know of one member of a class of every other. Nature is so constituted, however, that the mistake puts us on the right track. This explains, too, why we class together natural kinds instead of chance universals—say "Sheep," but not "Red things"—which Lotze seems to think requires a special Law of Thought to explain it.

Hegelian, however, like Professor Jones, goes one better, and frankly accepts the full connotation of Reality and nothing but Reality, though he continues to attach it to the term Idea. This seems the less necessary, as Hegel's great conception of the Activity of Thought in Nature is surely quite as compatible with plain Realism as with the Idealism that differs from it in nothing but in name. Idealists, we find, are becoming Realists again, as a Radical party now and then becomes Conservative, not by a change of front, but by a continuous absorption of Conservative elements. Nor is it possible that, in this case, the process can cease till the transformation is absolutely complete.

VII.—DISCUSSIONS.

THE PHYSICAL BASIS OF EMOTION. A Reply.

In the September number of the *Psychological Review* Professor James defends his theory of emotion against the various criticisms to which it has been subjected. It seems necessary to make some comment on the answer to my own objections, and also to bring out the full bearing of some statements of importance made in the course of the argument.

The most striking thing in Prof. James' article is the way in which he now defines his position. The theory which has caused so much trouble is after all, he declares, a very unpretending thing. It implies merely that the whole of consciousness, whatever its inner contrasts may be, is dependent on incoming currents (524). It assumes that there must be a process of some sort in the nerve centres for emotion, and it simply defines that process to consist of afferent currents (523). It merely asserts that emotion is not a primary feeling directly aroused by the exciting object or thought but a secondary feeling indirectly aroused (516). The primary effect is the organic disturbance (516), and this is the cause of the emotion (519).

In the *Principles of Psychology*, however, we find statements of entirely different import. "My theory is that the bodily changes follow directly the perception of the exciting fact, and that our feeling of the same changes as they occur *is*[1] the emotion" (II. 449). "If we fancy some strong emotion, and try to abstract from our consciousness of it all the feelings of its bodily symptoms, *we find we have nothing left behind*" (II. 451). "What kind of an emotion of fear would be left if the feeling neither of quickened heart beats nor of shallow breathing etc. were present, it is quite impossible for me to think" (II. 452). "What emotion can there be but the unpleasant nervous feeling itself?" (II. 458). "In such cases the emotion *begins and ends* with what we call its manifestations or effects. It has no mental status except as either the vivid feeling of the manifestations *or the idea of them*, and the latter thus constitute its entire material and sum and substance" (II. 458).

[1] The 'is' appears thus emphasised in the text. Elsewhere I have supplied the italics.

It does not seem possible to reconcile these two conflicting accounts. If the whole thing comes to the bare assertion that emotion follows as effect on the bodily disturbance, all that is maintained is the dependence of the fact on the perception of organic change, and nothing is said about the nature of emotion as such. But if no more than this was ever meant, how shall we explain the explicit statements which occur in the original presentation of the theory? There we have without doubt a definite account not only of the conditioning of emotion but also of the nature of the psychical fact. The emotion, it is stated in one place, *is* nothing but the feeling of a bodily state, *and has a purely bodily cause* (II. 459, see also II. 449).

How far Prof. James has moved will be evident from the fact that he approves of my description of emotion as reaction on cognition and hedonic effect, as feeling in regard to an object. He not only agrees with the sharp distinction drawn in my article between emotion so understood and pleasure and pain, but draws the same distinction between emotion and cognition. Emotion, therefore, is now sharply opposed to ideation and perception; formerly it was described as organic sensation or even as the idea of bodily change.

A further modification of some consequence requires to be noted. Whence comes it, says Wundt, that if a certain stimulus be what causes emotional expression by its mere reflex effects, another stimulus almost identical with the first will fail to do so if its *mental* effects be not the same? To this objection, which recurs in all the published criticisms, the reply is that we must remember the force of association in Psychology. Objects are certainly the primitive arousers of instinctive reflex movements, but they take their place, as experience goes on, as elements in total situations, the other suggestions of which may prompt to movements of an entirely different sort. But whatever be our reaction on the situation, it is in the last resort an instinctive reaction on that one of its elements which strikes us for the time being as most vitally important (*Psy. Rev.* 518). All this is perfectly true, but the objection was urged with such unanimity precisely because Prof. James seemed to exclude these factors the importance of which he now insists on. In the *Principles* it was argued that particular perceptions do produce widespread bodily effects *by a sort of physical influence*, antecedent to the arousal of an emotion *or emotional idea* (II. 457). A passage from Lange was quoted where he says that the emotion produced by an unusually loud sound is a sort of fright, *though it is by no means combined with the idea of danger or in any way occasioned by associations, memories or other mental processes.* Cases were cited to prove not only that we may fear before any articulate idea of danger arises, but also be afraid when we positively know there is no danger (II. 457).

In disowning all this and insisting on the intellectual condition of emotion, Prof. James has materially altered his position. The bodily changes are now held to be determined not by the bare

presentation of the object, but by the way in which the whole situation is regarded. This intellectual regard becomes the all important condition, for in determining the nature of the organic effects it determines the nature of the emotion. The practical identification of instinct and emotion can no longer be maintained. In the case of instinct the bare cognition of the object brings about particular bodily effects, in emotion it is the varying intellectual regard which is active. Hence, in any given case, while only one purely instinctive reaction can occur, many emotional reactions are possible.

Piecing things together we find that while the bodily changes determine the nature of the emotion, they are themselves determined by the intellectual regard. The latter is ultimately the real condition, therefore, and it is difficult to see why its efficacy should be mediated by physical change. The probability surely is that Nature here as elsewhere takes the shortest road, and this *a priori* supposition is strengthened by a view of the facts of the case. While the intellectual condition is unaltered the emotion remains the same; when it changes the emotion changes with it. On the other hand, in any given case the bodily changes may vary within wide limits without affecting the emotion, and in certain cases of anæsthesia organic sensation may almost disappear without any marked result. As the condition interpolated by Prof. James does not seem to serve any special end, strong evidence in its favour is absolutely essential. No satisfactory proof, however, is offered of its priority to emotion in point of time, and in the nature of the case conclusive evidence on this head cannot be forthcoming. In addition, as we have seen, it does not fulfil the first essential of a condition. One expects at the very least that a condition should appear in definite form, when the fact it is supposed to condition is so present.

It will probably be maintained that the merit of this view is that it solves the problem of the physical basis of emotion. Now it is on the *sensation* of bodily change that the emotion follows, as the test case makes clear. In the case required the normal physical changes must all be present, and simply because they are not felt our author expects to find that emotional susceptibility has disappeared. Emotion is not then a direct effect of the physical process, and to say that it is conditioned by sensation does not help in the least to determine what brain process corresponds to the emotional, though the sensation in question be that of bodily change. The sensation of a bodily condition is in this respect of course on the same footing as any other sensation. When Prof. James maintained that emotion was nothing but the feeling of a bodily state, he could with right claim that on his theory the physical basis of the fact was known. He no longer holds this position, and draws a sharp distinction between emotion on the one hand and perception and hedonic effect on the other. He can no longer claim, therefore, that his theory is in any way different from any extant theory on the question of the relation of emotional states and brain states. The

only peculiarity of his view is that emotion is regarded as dependent on two psychical conditions, whereas one is usually considered sufficient. It is not clear then that we should gain anything by adopting this account of the origin of emotion, but it is clear that if things were as here described the state of matters could only be regarded as a freak on the part of Nature.

Despite disclaimers on the part of Prof. James that he ever meant more than the theory we have been discussing, the first version tends to appear very distinctly towards the end of the article (cp. pp. 523, 524, 526); despite explicit assertions that he meant as much, there are expressions from which one might infer that he even meant less. I had pointed out that the admission of æsthetic emotion as a primary feeling unmediated by bodily change was a tacit admission that the theory did not apply all round. Such an objection, we are told, is an *ignoratio elenchi* having nothing whatever to do with the real view which only affirmed the dependence on incoming currents of the emotional seizure or affect (525)[1]. My objection holds whether emotion be regarded as the feeling of bodily change or as the effect of this feeling, and if Prof. James did not mean so much as it implied, the glory of his theory tends to melt into the light of common day. The whole thing reduces itself to the unassuming statement that emotion is dependent on perception. Nothing is said about the nature of the resulting fact, and the intervention of somatic resonance between the perception of the object and the emotion is apparently an eccentricity peculiar to the coarser emotions alone. It appears, however, as if the position were only stated so modestly when the 'subtler' emotions are in view. This last version may therefore be disregarded, especially as the states in question may be included under those mild feelings to which the name of emotion is denied (525). In any case there is no doubt that the theory most prominent in the reply is very different from that originally laid down in the *Principles*, and that it is from the standpoint of the former that all criticisms are answered.

This change of ground has necessarily thrown the greater part of my criticism out of joint. When I strove to shew that there is in every emotional state a unique element distinguishable from hedonic effect and cognition of any sort, I was simply taking up the challenge to produce a spiritual element, an element that is, which is not the feeling of some bodily state (see *Principles*, II. p. 455). I did not imply that I had "discovered by introspection a part of the emotional excitement which it was psycho-physically impossible that incoming currents should cause." My implied argument was simply that, if emotion has a unique character as feeling attitude, it cannot be right to describe it as sensation of any kind with or without hedonic colouring.

[1] To support my contention I need only refer to the *Principles of Psychology*, p. 468. The force of my objection is admitted by Mr Garner, who criticises my article in the same number of the *Psychological Review*, and is evidently in sympathy with Prof. James' general point of view.

XUM

In another place I urged that, if emotion is merely the feeling of the reflexes and these "vary indefinitely" in different individuals, the emotions must vary also and it is therefore a contradiction to say that the same emotion may have different expressions in different individuals. The reflexes, we are now told, do not vary indefinitely but within limits. Further, they preserve enough functional resemblance in the midst of their diversity to lead us to call the fears and angers of different men by the same name (519). Prof. James is thus committed to the task of determining what are the characteristic expressions of each emotion. When he claimed in the *Principles* that his theory freed Psychology from all bother of this sort, I drew attention to the fact that the task in question was a work of supererogation to any other theory except his own. Since the changes vary so much, the theory evidently can never be securely established until it is shewn that there are constant elements, which invariably accompany a particular emotion, and yet are different from those which appear in the case of other emotions.

The treatment of the various cases of anæsthesia seems to call for some remark. The test case requires a subject absolutely anæsthetic inside and out, who should say, when emotion inspiring objects evoked the usual bodily expressions, that no subjective emotional affection was felt. Prof. James lays stress on some cases examined by Dr Sollier and discussed by him in the *Revue Philosophique* (March 1894). One subject is almost completely anæsthetic, and is dependent for outward perception on hearing and the much enfeebled sense of sight. His psychical state is characterised by apathy, indifference, and extreme emotionlessness. The explanation of this is simple if we look into the matter. The mind of the patient is either asleep or in a dim twilight between waking consciousness and sleep. Things are for the most part not perceived, and if perceived he is not sure of them or able to catch their significance. He is not certain even of his own existence. This may be metaphysically a contradiction but psychologically a fact of wide-reaching consequence. When the saving sense of the reality of existence is gone, it is no wonder that interest in the blurred and uncertain world, which remains, goes with it. It is evident that this mental condition alone would destroy emotional susceptibility even if there were no anæsthesia. When laying down the conditions of this experimental test in *Mind* (1884, p. 203) Prof. James explicitly stated that there must be no mental alteration beyond that of the absence of emotion. Can it be asserted that in this instance the condition is fulfilled? Even as regards the physical state the circumstances are not favourable for a conclusive test. "The entire muscular apparatus is half paralysed so that locomotion is almost impossible." The emotional expressions therefore can never be complete, and in any case absolutely no attention is paid to these by the observer. Nor does the psychical state meet all requirements. The patient has at times a great fear that his daughter may be dead, and it is not even

stated that the solitary visceral sensation remaining to him is present on these occasions. In these circumstances one emotion is of course as damaging as a thousand, and, short of some process of immaculate conception, a physiological theory does not seem to have much explanation to offer[1].

On the other hand a very damaging case is brought forward by Dr Worcester (*Monist*, 1893, pp. 293–4). The patient could hear a little and had the visceral sensations connected with the evacuative needs. Otherwise the anæsthesia was practically complete. Yet "all the emotional sensibilities were present and only a little less vivid than in the unæsthetic state." The only remark Prof. James makes is that certain degrees of visceral and muscular sensibility remained, and as these are the important ones emotionally she may well have felt emotion. But surely it cannot be pretended that this insignificant remnant of organic feeling is always accompanied by emotion, or is capable in any case of playing the part which must be assigned to it in Prof. James' theory. The same organic feeling cannot cause all the different emotions, and the few here indicated cannot vary so much as would be required to furnish a different condition for each separate emotion[2].

A review of all the evidence brings to light the general principle, that the emotional state of anæsthetic individuals is approximately normal or the reverse according as the mental state is nearly normal or otherwise. This has the merit of applying to all the cases brought under our notice. With regard to several of these, on the other hand, Prof. James has no satisfactory explanation to offer[3].

One important point still remains to be noted. Prof. James complains that the discussion tends to become a merely verbal one. Though this is not strictly true, there is no doubt that the word emotion has not got a very definite meaning. This arises from the fact that the theories at present in vogue concern themselves for

[1] In the other cases anæsthesia was provoked by hypnotic suggestion. Apart from the 'fallibility of this method' the evidence supplied by these experiments does not seem to deserve much attention. As Mr Garner says, "we are never sure that we have the full emotional expression in any case, *the indications being rather the other way*" (*Psy. Rev.* 546). Very few observations were made and these refer only to the two emotions joy and grief. With reference to these cases I need only refer to Mr Garner's excellent criticism (*Psy. Rev.* 545–6).

[2] Here it seems as if the presence of some visceral change of some kind is all that is necessary. On the other hand if it be pointed out that organic change unquestionably gives rise at times to a mere local bodily perception, the answer is that the "emotional diffusive wave" is in these cases not complete (*Psy. Rev.* 522).

[3] Prof. James admits in one case that "the inemotivity may be a co-ordinate result of the anæsthesia and not its mere effect." He apparently thinks that, if more such cases were found, the doubt would be in great measure removed. As the mental condition alone would account for the disappearance of emotion in the instance referred to, it is evident that no multiplication of cases would avail.

the most part with an account of the origin of emotion. This seems to be the case, for instance, with the theory which asserts that emotion is a fusion of hedonic effect and cognition. If you point out that emotion has a character entirely distinct from either of the elements mentioned, the "Fusionist" will probably reply that the result of fusion is in every case different from the constituents as such. In consequence of this state of affairs the fact is described in all sorts of ways. Prof. James, for example, tells us that he took for granted without discussion that emotion meant the rank feeling of excitement. The feeling of excitement is, however, merely the feeling of stimulated general activity when this presents a more or less uneven or agitated character. This feeling is not present in admiration, contempt, reverence, etc., and is absent in the case of all deep permanent feelings such as affection, dislike and hate. It may be an effect either of the emotion itself or of the circumstances which excite the emotion. When our general mental and physical activity is stimulated but not to excess, and the result is not an agitation but a harmony, we have that glow or warmth which is sometimes spoken of as an inseparable element at least in emotion. It is not a characteristic of emotion in general, however, any more than excitement. A widow who was described as glowing over her recent bereavement would have a right to feel injured.

To convince ourselves of the present undesirable state of Psychology on this point we need only note the haphazard way in which the emotions are enumerated. As little trouble has been taken to find out what emotion is in itself, no systematic attempt is made to determine what states are emotional. The result is that all sorts of things will be found classed as emotions—belief and doubt; modes of behaviour such as courage and desperation, especially those (like revenge) due to an emotion; surprise, and the shock of any sudden presentation; complex mental states such as envy, vexation, and wonder; pleasures and pains such as æsthetic pleasure and the intellectual pain of contradiction[1]. Hence classification has come to be regarded as an almost insuperable difficulty. The states seem to be more numerous than they really are and certainly more heterogeneous. A false analogy between perception and emotion has also exercised considerable influence. Emotion is of course conditioned by cognition, but the full particularity of the latter does not come into play. If I am injured in any way, the emotion which arises is not essentially modified by the fact that the aggressor had clothes of a certain cut, features of a certain cast, and was of a certain stature. The particular case is always subsumed under some general notion, injustice, injury, impending evil, present good and so on.

It was in view of this state of matters that I attempted to bring out the most prominent element of those states which all admit to

[1] It is not unusual to find the last mentioned states classed as emotions by those who maintain that emotion is a fusion of hedonic effect and cognition.

be emotional, and I hope to be able to shew the practical advantages of this method. Emotion regarded as a form of feeling attitude is connected with a permanent feature of our psychical constitution. It thus ceases to be an anomaly, and can be shewn to play an intelligible part in our mental life. This seems a matter of no slight importance, and a physiological theory will always fail in this regard. It gives emotion a place but not a function in the constitution of our nature.

DAVID IRONS.

THE THEORY OF JUSTICE.

THE strong point of modern *a priori* ethical systems has on the whole been the theory of justice. Powerful attempts, such as that of Hobbes, have been made to derive its formulae and to establish its obligation on experiential grounds, but these have always seemed to leave something unexplained. Among recent theories on essentially the same lines may be mentioned that of W. H. Rolph, in his *Biologische Probleme*—a book to the distinctive ethical point of which justice was scarcely done in a review that appeared in *Mind*, vol. x. 281. A later attempt, in conscious dependence on Hobbes, is Mr Hugh Taylor's *Morality of Nations* (see *Mind*, XIII. 287, 425). This is worked out from the point of view of the special student of society; Rolph's starting-point being rather that of the naturalist. The essence of the doctrine in all its expressions is that the formulae of justice are the result of a conflict among societies, or among individuals; and that they are fundamentally "contractual," and suppose, in their abstract expression, the equality, in the particular relations involved, of the persons contracting. The formulae, when we appeal, as we must finally, to the ends for which they exist, have an egoistic reference. Their justification is that the interests of the individual are best attained by observing them in all cases.

Although there is a large portion of truth in this theory, it cannot quite maintain itself on its ground of pure egoism. When we suppose the rules of justice established by convention, we have to bring in some element of sympathetic imagination, or some intrinsic social character of men, before we can effectively get our formulae realised in action. Purely egoistic social units neither could nor would consistently practise the rules of justice. These rules, if we allow their partial origin in egoistic conflict, must somehow be attached to the sympathetic impulses that issue more directly in another class of virtues. Thus Hume, deducing the virtues of benevolence directly from sympathy, was able to incorporate in his ethics, with some modification, the theory of the egoistic origin of justice. According to Hume, in a society of which all the members were perfectly benevolent, justice would be superseded. It has its

true place in a society of which the members are neither wholly selfish nor wholly sympathetic.

If, however, we put justice in a lower place, then we are reducing to a subordinate rank a virtue that seems clearer in its obligation than any other. This is the point that can always be made by the *a priori* thinkers. The experientialist may indeed avoid part of the difficulty by taking the question on psychological instead of on distinctly ethical ground. According to the *a priori* moralist the formulae of justice are expressive of certain objective relations, and indicate the rule to be followed apart from any consideration of consequences. They have an immediate and intrinsic reasonableness. The equalities and proportions they require are something that ought to be apart from any end beyond themselves. The experientialist, on the other hand, cannot admit that they are obligatory in themselves and apart from all consideration of ends—that is, ultimately, apart from all subjective feeling in any individual. He may, however, give a psychological explanation of their peculiar characteristics. Their appearance of being specially obligatory may be explained as the impress left by the coercive action of the State in enforcing those moral rules that are necessary for its preservation. Their special clearness may be regarded as an aesthetic impression due to a certain quasi-mathematical character they have. The real reason why they have this character is, it may be said, because, in questions of distribution, we must have some fixed rule, and it is easiest to take that which is intellectually simplest. As a psychological fact, there is a certain pleasure in contemplating the relations the rules of justice suppose, and a certain pain in contemplating their derangement, quite apart from all consideration of consequences. Ethically, any formula would be good that could be got to work, but a formula not admitting of sufficient abstraction and generality fails to impress itself aesthetically. In themselves the laws of justice are simply one set of rules among others, specially important in view of the ends to be subserved by them; but, in pure ethics, the aesthetic character they derive from their simplicity is not to the point.

Still, after all psychological explanations, an answer has to be given to the rational question why the rules of justice ought to be observed. The experientialist must at last fall back on the position that justice owes its peculiar place in ethics in some way to the end for which it exists.

One great gain that has come to ethics from the theory of evolution is that the necessity of a social basis has been made clearer than it ever was before. Without social conservation no other end can permanently be attained. Hence the virtues by which the social organism is preserved are the most important of all. On evolutionary, as well as on general utilitarian grounds, this position has been assigned to justice. Because of its special importance for social conservation justice alone, or justice most of all, it has been contended by Mr Spencer, ought to be enforced by legal

penalties. Associations of its infraction with punishment, we may add from Prof. Bain's analysis, cause the appearance to go along with the reality of superior obligation.

Still, it is only on the rougher forms of justice that social stability can be said with truth to depend; on kinds of abstinence from aggression that are scarcely entitled to the name of a distinctive virtue. Mr Spencer has pointed out in his *Principles of Ethics* that the distinctive virtue of justice receives no formulation in the moral codes that have ruled over Eastern civilisations. Compassion, in all its forms, is obviously a different virtue from justice; and so also is strictness in carrying out the precepts of an authoritative code, though this is less obvious. In truth, justice as a special virtue was first distinctly conceived in Greece. Early poets and thinkers made attempts at its formulation. Plato made an exceedingly elaborate attempt, but in the end defined as "justice" something—namely the performance of its proper functions by each part of the State and by each part of the individual soul—which has never in any community been recognised as the distinctive virtue signified by that name. Aristotle returned to the problem, and succeeded in fixing the general conception as something that relates to distributions of social goods, and as taking for its intellectual basis relations of proportionate equality. In the development of European thought, the increased definiteness it has got since has come to a great extent from analysis of legal conceptions.

What emerges from historical consideration is thus not that justice in the distinctive sense is specially connected with the stability of all societies. Some at least of the Asiatic civilisations have been exceedingly stable. Yet in Asiatic societies the equalities and reciprocal obligations involved in the conception of justice have never come into clear consciousness. On the other side, European States, so far as experience can say up to the present, have been less stable than the more permanent States of the Eastern world; but the conception of justice has appeared, and has received more and more distinct formulation. What ground then must the experientialist take if he wishes to bring justice finally into relation with an ethical end, and is not satisfied with its presentation as an abstract formula bearing its own evidence in its aesthetic or intellectual character?

A ground seems attainable in the following way. The science of society may be considered as having reference either to societies so far as they are merely social aggregates, or so far also as they have political structure. In its general part the science of society might be called anthropology, in its special part political history. There is a corresponding distinction among the ethical virtues. Some have a general social reference; others have also a political reference. Over and above his existence as a unit in the social organism, the individual man may be a member of a free State. Now the ethical virtue of justice has always been understood to have a special con-

nexion with political ends. It has never been found possible to treat it adequately without reference to the State. If, taking it as an ethical virtue, we define it as that virtue which, when observed between individuals, tends to the preservation, or to the establishment, of a State of particular type, then we have a ground for marking it off from the other virtues. Obviously it both becomes distinctly defined in States involving relations between political equals who are also free—whether constituting the whole of the State or not—and, when practised, tends to the preservation of such States. Thus we are able to refer it to an impersonal end which at the same time the individual can regard with desire. If happiness is most attainable in a State that is politically free, then the end has the subjective meaning which, for the experientialist, is inseparable from it. A set of objective relations is indeed involved, as the *a priori* thinkers maintain, but they have somewhere as their accompaniment feelings that spring from the activity of personalities. The subjective end being thus definitely assignable, a ground can now be given from the comparison of societies for placing justice above the other virtues. For it is the virtue that tends to maintain in existence, or to bring about, or to extend, the best type of political society. And, as ancient thinkers saw, only in the best type of political society can the best type of individual existence be realised.

T. WHITTAKER.

VIII.—CRITICAL NOTICES.

Hegel's Philosophy of Mind. Translated from the Encyclopaedia of the Philosophical Sciences. With Five Introductory Essays. By WILLIAM WALLACE, M.A., LL.D., Fellow of Merton College, and Whyte's Professor of Moral Philosophy in the University of Oxford. Oxford: at the Clarendon Press, 1894. Pp. cciv., 202.

IT seems to be generally allowed, among competent judges, that the most satisfactory parts of Hegel's system are at the beginning and at the end. The Logic, whatever may be thought of its cogency and completeness, is at least a well-compacted system of thought-determinations, which can hardly fail to be illuminating even to those who are not able to accept its conclusions. The Philosophy of Mind or Spirit has in like manner been a source of instruction and inspiration far beyond the limits of the Hegelian school. It is only the intermediate part, the Philosophy of Nature, which has been the butt of Hegel's enemies and the stumbling-block of his disciples. We cannot here pause to inquire whether it is not inevitable, in any system like that of Hegel, that the intermediate part, in which mind is dealing with that which is most foreign to itself, must be the most difficult to reduce to a satisfactory form. It is rather our business to congratulate ourselves on the possession, in a convenient English form, of the general outline of the most satisfactory parts of Hegel's system. In the case of the Logic, indeed, we possess Hegel's maturest utterance. In the case of the Philosophy of Mind, what we have is rather a synopsis of the doctrines that are more fully set forth in the larger treatises on Law, Art, Religion, Philosophy of History, and History of Philosophy; together with a sketch of Hegel's view of Psychology, which is not fully dealt with in any other work (except in so far a part of it may be said to coincide with the *Phaenomenologie des Geistes*).

Prof. Wallace's name is a sufficient guarantee for the excellence of the translation. So far as I have examined it, it seems to be even more successful (partly no doubt because it was more easy) than his translation of the Logic. It is not only an accurate rendering of the meaning of the original, but it scarcely gives the impression of being a translation at all. It leaves one rather with the feeling that Hegel was at bottom an English author, and a good

writer of English to boot. The chief point on which a difference of opinion is possible is with regard to the advisability of rendering *Geist* "Mind" instead of "Spirit." There are of course arguments on both sides; and in his interesting note on the subject (pp. xlix–lii) Prof. Wallace has stated his case very fairly. Certainly the term "Spirit" carries associations with it which one would wish to avoid; and in choosing "Mind" instead Prof. Wallace seems to have been guided by similar motives to those which have led him, in the translation of the *Logic*, to prefer "reasonable" to "rational." In each case a certain mystical association is avoided. But in each case there are counterbalancing disadvantages. "Reasonable" is apt to suggest a reference to an abstract reason standing apart from its object and criticising it. "Mind," in like manner, suggests the thinking processes of an individual consciousness; and, if it is used to express the ultimate reality, it seems to imply a subjective idealism rather than an idealism like that of Hegel. Even the quotations which Prof. Wallace gives from Wordsworth seem on the whole to bear this out. Thus when Wordsworth tries to show "how exquisitely the individual Mind.. to the external world is fitted," he is thinking of the relation of Mind to world in a way that Hegel would hardly allow. Would it not be best, seeing that we have the advantage of the two different terms, to use sometimes the one and sometimes the other as occasion requires? I suspect that some of the difficulty in reading this part of Hegel is due to the use of a single term to cover different meanings. Thus in the more psychological parts of his work the term "Mind" seems best to express what is wanted, while in dealing with Art, Religion, etc., we require "Spirit." But as a general term covering both meanings I confess that I still prefer "Spirit," as being more objective and less liable to suggest a false dualism. And, after all, why should "Spirit" (as Prof. Wallace thinks) suggest 'religiosity'? Has Shelley's "blithe spirit" any such suggestion? Or has the word any such suggestion as used by Shakespeare?[1] *e.g.* in the passage:

> "We all stand up against the spirit of Caesar;
> And in the spirit of men there is no blood;
> Oh, that we then could come by Caesar's spirit,
> And not dismember Caesar!"

Substitute 'mind' for 'spirit' here, and no doubt the lines would scan better; but!—

Prof. Wallace's translation is accompanied, like his translation of the *Logic*, by interesting *Prolegomena*. These are given in the form of five Essays—"On the Scope of a Philosophy of Mind," "Aims and Methods of Psychology," "On some Psychological Aspects of Ethics," "Psycho-genesis," and "Ethics and Politics." Of these the first two and the last are perhaps the most important; but all are

[1] A more plausible objection to the term, as used by Shakespeare, would be that it is frequently suggestive of the old idea of "animal spirits."

extremely interesting, though perhaps occasionally, like the *Prolegomena* to the *Logic*, they have the fault of discursiveness. The way in which Prof. Wallace illustrates his subject from every side—referring indifferently to Herbart and Nietzsche, to Boethius and Münsterberg, to Fechner and Rudyard Kipling—is very wonderful, and gives his work a singularly concrete and living interest, without seriously impairing its scientific value. The wealth of the material, however, makes it difficult for a reviewer to select, and I must content myself with adding a few notes on points that strike me as specially important or interesting.

If any one, not expressly a student of Hegel, were to inquire what it is that gives special interest to this portion of Hegel's work, I should be disposed to direct his attention chiefly to two points. One of these is the attempt at a philosophical treatment of Psychology: the other is the attempt to bring Ethics, Politics and Religion into relation to one another. The former is discussed chiefly in Professor Wallace's second Essay, the latter in his fifth; but sidelights are thrown on them both in several of the Essays.

How far is it possible to treat Psychology as an empirical science? And how far is it necessary that it should rather be regarded, throughout, as a department of philosophy? This is a question which is inevitably suggested by Hegel's treatment of the subject; and Professor Wallace has devoted a good deal of attention to it. Some writers (*e.g.* Dr Paulsen in his *Einleitung in die Philosophie*) appear to hold that there is, properly speaking, no such thing as philosophy, but only a philosophical way of treating the particular sciences.[1] According to this view (unless I am misrepresenting it) knowledge has no centre. We start, as it were, from various points in the circumference; and our view becomes philosophical only in so far as we relate these points to one another in a more or less systematic whole. Thus, I suppose, every science (Psychology among the rest) would be primarily of an empirical nature, and would only gradually approach the philosophical form as an unattainable ideal. But this seems to be a one-sided view. Human knowledge appears to start inevitably at once from the circumference and from the centre. If the particular sciences may be said on the whole to start from the circumference, it is at least equally true to say that philosophy starts from the centre; and if we may regard the various human interests from this point of view, it may be said that every one of them has a two-fold aspect—a scientific and a philosophic. The sciences arise in the effort to coordinate the facts of experience, working from without inwards; while philosophy is the effort to see the significance of the same facts, regarded from the centre. If we accepted this view, there would be two modes of treatment for Psychology as for other sciences—one simply scientific, seeking to ascertain the facts and to coordinate them by means of *axiomata*

[1] Wundt, in his *System der Philosophie*, seems at some points to approximate too closely to this view.

media; the other philosophical, seeking to view the material in the light of a central principle. From this point of view, Hegel's Psychology would be related to ordinary Psychology just as his Philosophy of Nature is related to the particular physical sciences. And, broadly speaking, I am disposed to accept this view. But Professor Wallace has urged some forcible reasons (pp. lxi–lxii) for holding that Psychology and Ethics cannot be treated in quite the same way as the physical sciences; seeing that the former sciences deal with "the very centre and purpose of all reality." To this it might perhaps be replied that it is not quite fair to class Psychology and Ethics together in this way. Ethics, being concerned with the supreme end of life, cannot be separated from the metaphysical determination of the nature of that end. But it might be urged that empirical psychology is merely concerned with presentations as they appear upon the stage of consciousness; and that these are simply facts like any other facts. This answer is not ignored by Prof. Wallace (pp. ci–cii), but he does not regard it as a sufficient argument for the recognition of a distinct science of empirical Psychology. And certainly if self-consciousness is the central principle of reality it seems impossible to deny that Psychology is, in some sense, dealing with the central principle, and is consequently within the domain of Philosophy. Here, as elsewhere, "if two ride on a horse, one must ride behind." Either Metaphysic must rest on Psychology, or Psychology must become a department of Philosophy. It seems to me that Professor Wallace's arguments have much force against the attempt (made, for instance, if I understand him rightly, by Mr Bradley) to have a psychology out of relation to metaphysic. After all, any science is empirical only because it cannot help it. Some of the physical sciences, dealing with material, so to speak, on the outskirts of knowledge, not yet capable of being brought into system, cannot help being empirical. But when we are working at the very centre of knowledge, it seems absurd to try to be philosophically unphilosophic—to be empirical from *malice prepense*. All that Professor Wallace says on this point seems to me to be weighty and well considered; and his careful summing up (pp. xcii–xciii), though unhappily somewhat too condensed, may be commended to the attention of all psychologists. At the same time, I am not sure that Professor Wallace has not pushed his criticisms too far. After all, I suppose it is a truism to say that there is no truth but the whole truth. *Any* body of knowledge is incomplete till it is seen in the light of the whole. The misfortune is that *no* body of knowledge can be so seen. And this is a misfortune that attends psychology as well as all other sciences. Besides, unless subjective idealism is the truth, it is surely not quite correct to say that psychology is concerned "with the very centre and purpose of all reality." Though it is nearer the heart of things than any other particular science, it is still not quite at it. It is dealing, as Mr Bradley would say, with a higher "degree of reality" than any other science, but still not with reality as such. Hence I should be inclined to say that the

distinction on which Professor Wallace insists is, after all, only one of degree. Though it is true that psychology, more than any other science, should try to be philosophical; yet a legitimate sphere may still be left in it for a more or less empirical form of study.[1] And I think some parts of Hegel's own work may be taken as illustrations of this truth. At several points in his psychological construction, it seems almost as evident as in his Philosophy of Nature that he is dealing with material which is scarcely ripe for philosophic treatment. This is the case, for instance, with his treatment of animal magnetism,[2] on which, however, his views are given with considerable caution (p. 29 *sqq.*).

I should like to call special attention to Prof. Wallace's section (pp. xcix–cvi) on "Psychology and Epistemology," which seems to me to be one of the best discussions of that vexed topic in brief compass that I have seen. But I cannot enter on that subject here.

I could have wished, in connexion with Hegel's psychology, to have some light thrown on the relation between the section (pp. 47–58) called *Phenomenology of Mind* and the larger work with the same title. Have we here an instance of the double use of the term *Geist*? Is the section in the Psychology a mere Phenomenology of *Mind*, while the larger work is a Phenomenology of *Spirit* in the wider and more objective sense? This appears to me to be the essential distinction. The one discussion is psychological, the other epistemological. The one considers the growth of the individual mind from sense to self-consciousness: the other considers the development of the point of view of thought in general in relation to the world which it apprehends. But I merely suggest this as a point on which one would like to have further light.

So much for Hegel's Psychology. But, after all, it is in Ethics that his greatest triumphs have been won. The general nature of his triumph here has, I think, been admirably brought out by Prof. Wallace at several points in his introductory dissertations (see especially p. clxxxvii). It consisted in the subversion of the merely formal and negative aspect of duty which had been emphasized by Kant. Hegel insists that the good is not the mere good will; it is not simply an inner affair—an affair of the conscience. The true good is rather objective. It is, first of all, good character rather than good will. Then, further, we have to remember that good character requires good social and political conditions. And we have to remember, finally, that the human ideal is not fully realised in any form of social institution, but stretches out into the regions of art and religion. Ethics thus acquire with Hegel a larger and deeper

[1] There may even be room in it for what Chas. Darwin used to describe as "fools' experiments." But on the whole Prof. Wallace's objections to recent experimental methods in Psychology appear to me to be well grounded.

[2] In the more anthropological section of his work, the treatment of the different ages of a man's life (pp. 17–18) seems to me to be in Hegel's worst manner.

meaning than had been previously assigned to them (at least since the time of the best Greek speculation). It is possible, indeed, that Hegel, in his opposition at once to Kant and to the sentimentalists, may have gone a little over to the other extreme; and on the ethical side, as on the metaphysical, the partial return to the starting-point of Kant made by such a writer as Green may not be without its justification. For there can be no true realisation of the objective side without the subjective accompaniment—a truth of which Hegel was of course perfectly well aware. Hegel seemed sometimes, as Prof. Wallace remarks, to avoid the very word 'moral' (*moralisch*); and though of course this does not mean quite the same as it would in English (the Germans having the preferable word *sittlich*, for which perhaps we in English might use 'ethical'), yet it seems to imply a somewhat undue disregard of the subjective side. Ethics, with Hegel, tend to become dispersed into the theory of rights, politics, art, religion; the consideration of the will and the ideal of conduct fall somewhat into the background. Still, if this is an error, it can hardly be doubted that it is an error in the right direction; and English ethical writers have still much to learn from Hegel in this respect. Ethical speculation is a very meagre and ineffective thing if it does not advance into Social, Political and Religious Philosophy.

Some of Professor Wallace's best work in his last essay has reference to Hegel's view of the state. He has here given, as I think, the best vindication that we have yet had of the philosophical wisdom of Hegel's political attitude. It is too often supposed that Hegel's theory of the state grew up, according to the elegant utterance of Fries (p. clxxix), "not in the gardens of science but on the dunghill of servility." He is thought of as a mere rationaliser of the *status quo*. Professor Wallace has shown that, on the contrary, much of what he has written may be regarded as belonging to Utopia, and has urged that perhaps in the end some of his ideas "come nearer the conception of ideal commonwealth than many reforming programmes."

One of the most interesting features of Professor Wallace's treatment of this subject is his reference to two early works of Hegel—*Kritik der Verfassung Deutschlands* and *System der Sittlichkeit*—both edited last year by G. Mollat. These are important as indicating the way in which Hegel's views of politics grew up. Hegel seems to have been specially influenced, apart from his philosophic principles, by the study of Greek ideals, on the one hand, and by the study of the English constitution, on the other. It is curious to note points of resemblance in his speculations to the views of writers so different from himself and from one another as Hobbes, Comte and Carlyle (see especially pp. clxxxii–clxxxiii).

In this notice, it has only been possible to touch in the most cursory fashion on some of the leading points in this fascinating volume. To the serious students of Hegel it makes an important part of his system more readily accessible. To those who are sceptical

of the dialectic method or weary of the labour of the notion it will perhaps be specially attractive on account of the numerous passages in which, as Professor Wallace says, Hegel 'lets himself go.' Some of his most penetrating utterances on religion and life are to be found here. And some of Professor Wallace's own remarks on these matters are scarcely less instructive.

I cannot conclude without expressing some regret that Professor Wallace has not seen fit (as in the case of the *Logic*) to translate the notes as well as the text. Perhaps when a second edition is called for (which I trust will be soon), he may be able to earn additional gratitude from philosophic students by adding these also[1].

J. S. MACKENZIE.

Psychology, Descriptive and Explanatory. A treatise of the Phenomena, Laws, and Development of Human Mental Life. By GEORGE TRUMBULL LADD, Professor of Philosophy in Yale University. New York: Charles Scribner's Sons, 1894. Pp. xiii., 676.

In 1887, Professor Ladd published his *Elements of Physiological Psychology*; the first manual of the science to appear in English. The work was based, to a large extent, upon the second edition of Wundt's *Grundzüge*. It was well received by the technical journals[2]; and though much of its subject matter impressed the reader as being an exposition at second or even at third hand, it has been distinctly useful to the student of the science and undoubtedly valuable to the science itself.

The present volume—which had far better have been two—is, literally, a weighty production; it turns the scale at three pounds avoirdupois. Though shorter by twenty pages than the *Elements*, it is a considerably lengthier book, free recourse having been had to a particularly fine print for supplementary or explanatory discussions. Its contents might not inaptly be described as "human warious"; and this variety renders the reviewer's task especially difficult. Since an adequate examination is wholly out of the question, it may be well to devote the body of this notice to certain general considerations.

In the first place, the author seems to have succeeded very well in the affiliation of his systematic to his physiological psychology. The latter is not intruded upon the reader of the new work, but is, nevertheless, constantly recalled to his mind in its reading. There is, of course, an especially close relation between particular sections

[1] I may take this opportunity of correcting a small misprint in the previous notice of the *Logic*. On p. 396, line 30, for "*Germany*" read "Germanity."

[2] Cf. Professor Cattell in *Mind*, vol. xii. O. S., pp. 583 ff.

of the two volumes: as, *e.g.*, between ch. x. of the *Elements*, and chs. xvii., etc., of the *Psychology*; or, more generally, between Pt. III. of the former and Pts. I. and III. of the latter. But there is quite as much modification as repetition, and the author's claim to have presented a new treatise must be admitted. Secondly, Professor Ladd's retention of the synthetic method is, in my opinion, entirely justified. Wundt naturally kept it in his fourth edition: Külpe has shown that it is altogether applicable for purposes of text-book presentation: and recent terminological developments have been readily accommodated by it. It is the method of more orderly results, and, therefore, possesses a pedagogical advantage; while it is also scientifically honester than its rival. The analyst can smuggle in a *sui generis* process when he will, and evade the question of elements altogether. The synthetist is bound to have his elements clearly defined and adequate, since the whole of concrete mentality must be built up from them.

At the same time, the author's position is hardly consistent throughout. The concrete processes of ideation (ch. xiii.), intellection (ch. xiv.), and attention (ch. v.; cf. p. 289), cannot be described as elemental, in the sense in which sensation, feeling (affection), and conation are. Indeed, it is apparently failure to recognise this fact[1] which has led to the tirade against pleasure-pain on pp. 167, etc. No one denies the experiential difference of the concrete feelings (p. 170): what is maintained is that 'surprise,' 'expectation,' etc., are complex processes, and not mental elements at all (cf. the author's own indication of this, p. 179). Chs. ix. and x. are, in other respects than this, two of the most debatable in the book. That it is possible to attend to feeling as such (p. 170) is hardly admissible; "feelings of relation," in the only legitimate sense of this phrase (pp. 174, 199), are surely psychoses of a higher, not of the first order; 'mixed' feelings (p. 181) enjoy but a doubtful existence; the central indifference point of the affective curve (p. 189) may be regarded simply mathematically; centrally excited pleasures and pains *can* outweigh peripherally excited (p. 199)—else how would civilisation be possible?—etc., etc. The discussion as a whole is neither sufficiently comprehensive nor 'up to date'; although some parts of it (*e.g.*, the sections dealing with the relation of language to feeling) are admirable.

Nor is Professor Ladd's methodology unexceptionable at the other end of the scale of mental development. The concrete mind —and this is one of the dangers of synthesis—becomes, in his hands, somewhat amorphous. Logic is granted a quite unwarranted preference over Ethics and Aesthetics. Logic is really not wanted in a psychology: but if the psychical substrate of logical processes needs elucidation, so also does that of the ethical and aesthetical judgments (cf. chs. xix.–xxii., xxiv.). Again, while the author maintains that his book "abandons even the appearance of retaining the

[1] 'Sensation' is employed as equivocally as 'feeling.' Cf., *e.g.*, p. 150.

old and vicious theory of faculties" (pp. viii., ix.), we find chapters headed 'Memory,' 'Imagination,' etc. (and cf. esp. p. 381). This procedure, which is, of course, traditional, is certainly convenient, but should consistently be avoided. It is better even to replace the term 'Imagination' by some such cumbrous phrase as 'conative connections and disjunctions of ideas,' than to let it stand in a work destined, in part at least, for class instruction (p. ix.). Once more, the relation of complex processes to the elemental is not always clearly brought out; perhaps on account of the equivocal use of the term 'element,' to which I called attention just now. The writer, for instance, takes the newly developed and still developing doctrine of Fusion very half-heartedly. The word is not infrequently employed (pp. 180; 209; 224 'blending'; 554; 592; 601 'blended'); but apologetically, and without differentiation from association (p. 269). Nor is it attempted to present fusion-processes in any order of increasing complexity; Sentiment being treated before Impulse and Instinct, and these latter formally correlated with Desire (p. 602). While Attention, discussed in ch. v. as one of the "most general forms of mental life," does not appear again in the whole volume save incidentally (p. 213, relation to conation; 366, influence on perception; 394, relation to memory). Yet the definition of the act of attention makes it a very characteristic and highly complicated fusion (p. 61). Finally, the elemental 'intellections' of ch. xiv., where they are not merely logical processes, had better have been explicitly, as they apparently are implicitly, regarded as *fundierte Inhalte.*

In the third place, the reader cannot but notice, and may, I think, with some justice complain of a tendency of the author's which has been suggested above, and has led to the criticism of his work as 'tedious,'—the tendency to 'get everything in.' Psychophysical discussions—and some of Professor Ladd's views are more than doubtful—are out of place in a systematic psychology. The burden of illustration, for which Japan is largely drawn upon, is over great: the student would in most cases be better done by if left to think out his instances for himself, and the teacher, if competent to teach, is able to supply them from his own experience. Four of the chapters of Pt. III. might have been reduced to one, by a stricter adherence to psychology proper. And this craving for completeness leads the writer, quite in the analytic manner, to admit 'unique' and 'fundamental' processes (as, *e.g.*, the "spiritual synthesis" of memory; p. 401: the "mysterious fact" of the bipartition of psychoses into thing-references and self-references; pp. 519, 520: the "mysterious form of mentality," belief; pp. 512, 514: the "new form of reaction," time-consciousness; p. 310: etc.), over and beyond the mental elements *sensu stricto.* To set out with a certain amount of bricks and mortar; and to discover, when one's edifice is finished, that it contains features not to be accounted for from the given brick and mortar *quantum*; is really to stultify one's chosen method and to give up all hope of a scientific formulation of

one's data. Professor Ladd, with his emphatic insistance on the scientific character of Psychology (pp. 6, etc.), would be the last to let this hope escape him. None the less, the facts remain as stated; a puzzle to the student, and a stumbling-block to the more advanced reader.

It is the business of the critic to be critical; and there has been a good deal of fault-finding in the previous paragraphs. It would be curious if a psychology of 670 pages could *not* have a good deal of fault found with it. There are two minor points of style which, I hope, the author may alter in a new edition. The first is the frequent and contemptuous mention of an imaginarily rampant psychophysicist (pp. 164, 399, 409, 520, 625): contempt (p. 175) is hardly ever a philosophically becoming attitude, and its expression in language is rarely judicious. The second is the betitling of American workers, whose foreign co-labourers are quoted by surname alone. But, these and other objections duly urged, the reviewer cannot fail to find in the present treatise vastly more excellences than defects. I regard the *Psychology* as a thoroughly good manual: indeed, as much the best of the great series of American psychologies. Did space admit, it would be easy enough to enumerate many points of agreement with for each point of dissent from the author. Although I feel strongly that we have had almost enough of systematic treatises, and that the science at its present stage can be best advanced by a monograph literature[1]; and although I must confess to have begun the reading of this bulky work with some feeling of aversion to its size and to part of its expected contents; I have found in it much of valuable instruction and a full apology for its own existence. I hardly think that it can be abridged and popularised in such a way as to supplant, say Höffding, as a handbook for beginners; but I should regard it, after Sully's *Human Mind*, as the safest text-book for advanced students in English.

I conclude this notice with a brief enumeration of the contents of the book. The Introduction contains two chapters on the definition and problem, and on the method, sources and division of Psychology. Pt. I. (on the most general forms of mental life) deals in three with consciousness and self-consciousness, the so-called mental faculties, and primary attention. I cannot but think that both arrangement and nomenclature are here faulty. Pt. II. (the elements of mental life) devotes three chapters to sensation, two to feeling, one to conation, one to idea, one to ideation processes (association, reproduction, etc.), and one to primary intellection processes (consciousness of resemblance and difference, assimilation and dissimilation, rudimentary judgment, time-consciousness, etc.). The 'local sign' chapter, like those on feeling, is open to criticism. Pt. III. (on the development of mental life) contains chapters on perception by the senses (2), memory, imagination, thought and language, reasoning, space time and causation, knowledge of things

[1] Cf. President Hall, in *Am. J. of Ps.*, VI., p. 477.

and knowledge of self, emotions and passions, sentiments, impulse instinct and desire, will and character, and types and principles of mental development. Extensity is denied to all sensations (pp. 327, 495). It is curious to contrast the author's giving up of an explanation of memory with Külpe's resolute effort, in his recently published *Grundriss*, to grapple with the problems of reproduction and recognition. The evidence bearing upon the psychology of induction and deduction (direction of association, subliminal discrimination, etc.) does not seem to be adduced, either in the reasoning-chapter or (at least, fully) elsewhere. Time, too, comes off rather poorly. The discussion of the will is characteristic, and written *con amore*. In the final chapter the writer very rightly devotes some pages to the sexual difference, as he did also in the *Elements* (pp. 570 ff.). It is a point too often neglected in psychological treatises.

The index (pp. 671–676) is fairly complete; the large print is good, the small—being very black on very white—trying. The volume is much too heavy to be easily handled in class work.

E. B. TITCHENER.

The Theory of Inference. By the Rev. HENRY HUGHES, M.A. Kegan Paul, Trench, Trübner & Co., 1894. Pp. vi., 256.

Any student of Logic who has tried to make practical use of his science in pursuing more concrete studies must have felt at times a suspicion that its present range is, in spite of the methodology added in recent years, still inadequate. To mention two issues of very different kinds, the occurrence of the New Testament miracles or of modern phantoms and telepathy, and the social arrangements, freedom or slavery, which initiated the line of progress followed by our English peasantry within historic times. These are specimens of enquiries as interesting as those of Physical Science, and for which Logic nevertheless does not offer the same technical aids. In several of its chapters the description of Scientific procedure is broadened so as to meet the needs of the Historian also, but there has not been the degree of distinction in treatment which the distinctness of sphere really demands.

The chief merit of Mr Hughes' book is that it places in clear antithesis the field of Natural Law and the field of History and only just misses becoming itself a methodology of History. If it had been written under the bias of a purely logical interest, if the author had felt the stress of historical problems and had deliberately set himself to supply logical aids, it might have accomplished more. But Mr Hughes' interest in his work is indirect. He began to write a treatise on religious faith. This became "a defence and explanation of the habit of assenting to propositions which are not capable of being demonstrated by one man to another." Then

historical inference being an example of such a habit, he set himself to show and vindicate its peculiarities, and in pursuing this task "it has come to pass that logical inference from its foundation upwards has been made the subject of investigation." Mr Hughes does not intend like many apologists for religion to make use merely of the undemonstrable assumptions of Science. These assumptions he deals with but only sufficiently to rationalize his exposition of logical methods. His aim is to show that historical inference, though based more extensively than Science upon the individual experience of each enquirer and not transferable from one person to another so easily, is nevertheless an invincible habit of Intellect, and "the assurance with which the mind assents to concrete truths in the field of history may be no less intense than the confidence with which it makes deductions in the field of natural law." We shall look with interest for Mr Hughes' explicit application of his results in a future book on religious faith. He can scarcely rescue Faith altogether from obligations to show some veins of reason threading its substance. At any rate he cannot do it merely by using the analogy of History. For although History has and ought to have a bias of procedure distinct from that of Science, I do not think that Mr Hughes will convince his readers that it is altogether independent, or that the historical imagination ought not at least to be chastened by a previous discipline in Science.

About one-third in amount of the contents of the book consists of topics usual in theories of Inductive Inference, Causation, Uniformity of Nature, Inference, Induction and Deduction; the last two representing what would be ordinarily recognized under titles such as Inductive Analysis and Inductive Generalization. Another third expounds some topics which are an addition to current logic, the contrast between the "field of Natural Law" and that of History, the principle of the Continuity of Nature, and the forms of inference, Delation and Illation, which are special to the field of History. These two kinds of content of the book are divided from one another in order of treatment. There is a third kind which is interwoven with the treatment of both the others. The investigation is carried on with explicit reference to Mill's views, and considerable controversies with him occur at the appropriate stages in regard to the empirical derivation of the conception of Uniform Causation, the unification of the several types of Inference, and the application of the theory of probability to circumstantial evidence.

The Inference, of which this book is the theory, is movement from the known to the unknown, and is only made in the light of certain conditions that have to be fulfilled, conditions of relation between the new and the old. These conditions are involved in the conception of Causation, and with this, accordingly, Mr Hughes commences. The explanation of the act of Inference is that the mind possesses independently of Inference the conception of Causation. "It is contended that there is some interval of time,

however inappreciably small, between recognition of the fact that one phenomenon has a cause or effect, and recognition of the fact... that another is the cause, or is the effect." This conception is "in some way an object of immediate knowledge." Further, in order that the more special conditions of inference may be evolved from it, it must have two distinguishable constituents. Effect must proceed from, and not merely succeed to, cause; otherwise, if I understand Mr Hughes rightly, the mind instead of inferring from one to the other, will lose itself amid an infinitude of antecedents or consequents, or will follow the chain indefinitely. And effect must also proceed according to design of nature; it must have a formal as well as a phenomenal origin; otherwise the relation will not avail beyond the limits where it has been observed.

From this richer conception of Causation may flow the two principles which formulate the conditions referred to in the definition of Inference. The first is the Uniformity of Nature. "The conception of the relation of particular effect to particular cause as one of procession from, in accordance with the design of nature, includes the further conception of it as independent of time and place...All similar causes or similar effects produce or are produced by similar effects or causes." This principle emerges whenever we make two of the kinds of Inference, Induction or Deduction. Induction appears to be what is usually called Inductive Analysis and Elimination. It is "the discovery within a selected range of circumstances of a cause or effect by means of comparison and contrast," a way similar to Mill's experimental methods with some reservations. Deduction "consists in ascertaining a cause or an effect by apprehending it to be precisely similar to the known cause or effect of a precisely similar effect or cause." It appears to include not merely the application of inductive truths to new cases, as in ordinary usage, but also the generalization which follows Inductive Analysis, and "transforms the inductive conclusion into a law of nature." And though it thus is a step sequent to Induction, it also occurs in a tentative or hypothetical form in the course of making Inductive Analysis itself, and in this latter place corresponds to the process of Delation which Mr Hughes gives as preceding what might be called Historical Induction or, as he calls it, Illation.

At this point begins the contribution to logical theory which forms the special merit of Mr Hughes's book. The results of Scientific Induction, though drawn from concrete incidents as material, are themselves abstract in their reference. They deal with phenomena that have exact counterparts in other things and places and are sundered from historical connections; with aspects found embodied in incident and not with incident in all its concrete determinations and local and temporal conditions. To reach incident in the concrete we cannot have as a clue that exact similarity between aspects of the new fact and the old which justifies Deduction and Induction. Another relation must be

found; and Mr Hughes finds it in a second logical principle co-ordinate with the Uniformity of Nature.

The conception of design in nature carries with it continuity in the action, and in the grouping, of natural causes. Elemental forces operate throughout all time, and the same special combinations of causes recur. Principles of this kind, I may here note, are not novel in Logic. Similar ones are stated, but with more careful limitation and distinctions, in the latest authoritative version of Empirical Logic, Mr Venn's. Continuity is there treated, to a large extent, as a condition under which Uniformity can be realized rather than as a co-ordinate principle. It bears a similar relation to Uniformity which in Psychology the faculty of Retentiveness is sometimes stated as bearing towards the function of Assimilation. But with an *a priori* origin and an independent sphere of its own, it becomes something more questionable.

The sweep that Mr Hughes allows it we may judge from his criticism of Mill's assertion that our expectation of the Sun's rising to-morrow depends on our confidence that no causes are at work whose sudden conjunction will disorder the solar system. Mr Hughes goes the length of affirming that the law of being of the primeval forces "involves complete immunity from catastrophic disturbance so long as the present order of things, with which alone investigation is concerned, continues to exist," and that we have no right to assume the possibility of the "present constitution of things" failing.

This large demand on our faith in the Continuity of Nature appears to be made with a view to detach the methods of historical inference from those of Science. Mr Hughes proceeds to formulate the method of Delation. This "consists in arriving at knowledge of an event by means of the consideration that it must, in respect of the time and manner of its appearance, maintain the traditions of past experience." Its main importance is as a constituent in a more complex process, that of Illation. Here it appears as supplying the determination of an historical situation in such propositions as these. The cause of an observed event, p, is either an a or a b or a c or a d, antecedents of each kind having been previously given along with p in experience. Again, an observed antecedent P has as effect either an a or a c. Finally, certain observed incidents of p, have each sprung from one of a set of alternatives which have only a and b in common. There is an inference now possible. The cause of p is an event of the kind a. This inference is Illation: "the discovery of a cause, or an effect, by associating with the phenomenon other facts, and formulating some event which explains them all in congruity with past experience."

I will quote one example to illustrate both the contrast between enquiry in the field of Natural Law and enquiry, which may be concerning the same fact, conducted in the field of History, and the contrast between the method of Induction and that of Illation.

Suppose our object is "to ascertain the cause of John Smith's

cold regarded only as a manifestation of the abstract phenomenon" of taking cold, "we fix upon a number of persons likewise suffering from cold," and by comparing their cases "it may happen that we shall find that all the persons, including John Smith, have lately been subjected in one way or another to unwonted changes of temperature. This being so, unwonted changes of temperature, we more or less confidently conclude, are the cause of the cold from which our friend is suffering. With the particular occasion of his being subjected to them we have no further concern." If, however, we seek to know the concrete cause of a cold regarded as a concrete incident, "we take, let us say, the patient's loss of appetite as an effect presumably proceeding from the same cause as the cold, and his having had a certain hot bath as a remoter cause to which this common cause may be due. Consistently with what we already know of nature we can now fix upon an event which is at once the cause of the particular cold and loss of appetite, and the effect of the particular hot bath," namely, a chill.

The above illustration of Illation does not expressly mention alternative causes or consequences, and I will add another example because it illustrates the formulation of alternatives which Mr Hughes's symbols have in contemplation, and also is specially important in itself. With the statements of a witness in a law court, we may associate as determinative incidents his straightforward manner, indifference to immediate consequences, and earnestness. These incidents may reduce the several alternatives of possible causation to two, accurate sincerity and inaccurate. If we know him to be a person trained in observation we have a cause adequate to produce either accurate sincerity or studied inaccuracy. The explanation of the testimony becomes according to the formulæ of Illation, accurate sincerity.

That Continuity in Nature has such a sweep of truth as to place Historical evidence on a footing independent of the Uniformity of Nature is, it seems to me, an extravagant claim. If the observed antecedent P is identified by some characteristics outside those which on previous occasions have made it the cause of a or c, I do not believe that Nature will inevitably favour the historian by attaching these causal items also, or will confine its variations of collocation within limits that will allow a rigid list to be made of the only alternative consequences possible. If the formulæ of Illation are to be confidently followed Delation must not rely for its list of alternatives merely on a 'simple enumeration' of the sequences which our memory gleans from uncritical experience. We may insure ourselves to some degree against nature's vagaries of collocation by knowing that the descriptive characteristics of an antecedent form part at least of the abstract cause of the characteristics of the alternatives, that temperature of the skin has to do with chill, and mental training with accuracy of any man's discourse. And we may further discriminate between collocations, arranging them in a rough scale of permanence, and trusting to

some more than others. Real history must follow the clues given by abstract causal features; its only privilege is that where these fail it may step a little further, presuming on the permanence of collocations, than Science should, and it must combine its clues in a special way. Mill was nearer the realistic description of Historical method than Mr Hughes is, when he made it a sort of pendant to Scientific method, and expected the forms of Hypothesis, Deductive Method, Analogy or Probability to be adapted by each man to his own practical emergencies. And if this is so, the condition, also, under which Mr Hughes allows illative inference to be taken for objective truth, that it must be drawn in a part of the field of History to which the experience of the enquirer belongs, is insufficient. It must be drawn in conformity with Inductive Science. No doubt, however, the logic of history and of practical emergencies should be set forth as a distinct type and form in Methodology, as Mr Hughes has made it. And if instead of controverting Mill all along the line of discussion, he had selected only those points where Mill's recognized disciples and successors still hold with him, and had generally brought the whole discussion into explicit comparison with the body of now current Logic, his book would have been one of the most acceptable.

J. Brough.

Vorlesungen Kants über Metaphysik aus drei Semestern. Abh. der philol. hist. Classe der Königl. Sächsischen Gesellschaft der Wissenschaften. Von Max Heinze. Bd. xiv. No. vi. Leipsic: S. Hirzel, 1894. Pp. 483—728.

The history of Kant's mental development has recently received marked attention. This interest was stimulated by the divergent analyses given by Ueberweg, Erdmann and Vaihinger. In this particular department of Kantean study the present year has been prolific. Emil Arnoldt has just now brought into book form his masterly essays, on the Kritik and Prolegomena, which have appeared since 1888 in the Altpreussische Monatsschrift, Ed. v. Hartmann's latest volume is *Kants Erkenntnistheorie und Metaphysik in den vier Perioden ihrer Entwickelung.* Harald Höffding has contributed two valuable articles to the Archiv für Gesch. der Philosophie on the *Kontinuität im philosophischen Entwickelungsgange Kants.* Arthur Drews has attempted an exposition of Kant's system from the standpoint of his natural philosophy, and Professor Heinze has brought together for critical and comparative study five MSS. from Kant's lectures on metaphysics.

In 1821 Pölitz edited from two MSS. Kant's lectures on metaphysics held during the winter of 1788—90. This contribution was so far forgotten or ignored that Kuno Fischer makes no reference to it in his two volumes on Kant, while Rosenkranz

and Hartenstein, in their editions of Kant's works, merely allude to it without any apparent appreciation of its essential or historical value. Late in the year 1892 Professor Heinze discovered the MSS. from which Pölitz made his edition. It appears that the editor had taken broad liberties with the MSS. striking out as he tells us "einige wenige Stellen." In addition to these two MSS. found in Leipsic other two have been brought to light in Königsberg, while a fifth MS. is in the hands of Dr Kranse of Hamburg. From their location these MSS. are indicated by the symbols L^1, L^2, K^1, K^2 and H. The latter MS. has escaped the notice of both Erdmann and Arnoldt. After critical examination Dr Heinze concludes as follows as regards the date and general character of the several MSS. L^1, K^1 and H are copies of an original MS. which stood for lectures given by Kant within the years 1775—1780. Arnoldt puts L^1 and K^1 in the winter of 1779—80 while Erdmann places them as early as 1773—74. The form and matter of these lectures differ so much from the Kritik of 1781 that one is inclined to assent to Erdmann's earlier date, even remembering that the K. v. V. was "written out within a period of four or five months." The dates of the other MSS. fall after the first and second editions of the Kritik, L^2 in the winter of 1790—91 and K^2 in the winter of 1794—95. It is interesting to note that the author of the Kritik, who will have nothing to do with metaphysics, begun lecturing on this subject in 1770 and continued to lecture every winter semester until 1795, when he laid down his university work; and that throughout this entire period he made Baumgarten's Metaphysics the basis of his lectures. It is evident that the importance of these lectures is considerable, lying as they do on either side of the two editions of the Kritik and covering a period in which elucidation of Kant's development is most desirable. Their value is enhanced by the fact that they were introduced at the time when Kant said he had come upon "great light" and wished none of his writings earlier than 1770 to be regarded as expressing his philosophical views. That Kant himself attached great value to these lectures and desired their publication appears from several letters to Marcus Herz in 1778, and from Jaesche's introduction to Kant's Logic in 1788.

In regard to the form and content of these lectures there is of course essential agreement in L^1, K^1 and H, as they are copies of an original MS. Here the doctrines of time and space appear in clearer lines than in the Dissertation of 1770, but as yet there is no distinction between the theoretical and practical reason, and no indication of the cosmological antinomy. In L^2 and K^2 the exposition is more after the Kritik. It is noteworthy that in both series of MSS. Kant is even more dogmatic in his procedure than in the second edition of his Kritik. There is frequently open disagreement with doctrines that are commonly attributed to the critical writings. This dogmatic spirit, manifested just before and after the critical publications, may be accounted for, in part, in that the Professor in the lecture room speaks more from his inner self and for the

guidance of learners, while criticism belongs more to the pen and the quiet of the study. However this may be, these lectures are a remarkable revelation of Kant the teacher, and must tend to modify some of the more rigid constructions given to the Kritik. It is clear from the second edition of the K. v. V. L^2 and K^2 that the real Kant, like Hume, stood somewhat aloof from his more critical and sceptical classic. In the first series, Kant, following Wolff, subdivides his matter as follows: Prolegomena, Ontology, Cosmology, Theology and Psychology. In the second series the order Theology and Psychology is reversed, probably on account of Kant's increasing emphasis of the practical significance of metaphysics and the crucial importance of rational Theology. With a partial exception of K^2 the lines of this subdivision are not very well preserved. This arises in part from mixing pure and applied metaphysics; in part from the freedom of the lecture room and the intensely practical aim of the lectures. Kant tells us expressly: "The main business is morality, this we must guard as the apple of the eye, this is the ground and end of all our speculations and investigations." From first to last God, Freedom and Immortality are the all important ideas. It is to be noted that *Glückseligkeit* plays a far greater *rôle* in these lectures than in his other writings. Now and again it comes to the front as the proper goal of human conduct. Kant's difficulty in attempting to exclude happiness as an end is manifest in the following words concerning the moral imperative: "Sie ist nicht eine Anweisung der Handlung, wodurch wir glücklich werden, sondern nur, wodurch wir der Glückseligkeit würdig werden. Sie lehrt uns allein die Bedingungen, unter denen die Glückseligkeit möglich ist, zu erlangen."

In the ontology of the earlier lectures we find a marked advance over the Dissertation. The matter of the Kritik is presented but in a somewhat different order. The categories are indicated and fixed with the exception of modality, which appears to be troublesome to Kant. He holds that the categories of ontology can be established and that metaphysics is the only true philosophy. In regard to space and time we find what Vaihinger seems to have found from a study of the Kritik, viz., that they are innate ideas which precede and condition all experience. Kant's language is extreme when regarded from the standpoint of the Kritik. Of space and time he says: "sie müssen gedacht werden ehe noch die Dinge gedacht werden." In his later lectures, L^2 and K^2, we find the same position: "Raum und Zeit kann ich mich daher *a priori* vorstellen; denn sie gehen vor allen Dingen vorher." As to Teleology, Kant evidently wishes to banish it from philosophy but sees no way of completing a system without it. He repudiates the dogmatic idealism of Leibniz as well as the dogmatic egoism of Spinoza as useless in philosophy. He thinks that Plato and Epicurus can be subsumed under one complete doctrine, which postulates behind all secondary causes a Being "das Alles zweckmässig eingerichtet habe." The idea of God is "allerdings ein reiner Vernunftbegriff" * * * "ein ganz unver-

meidlicher Vernunftbegriff." In regard to Theology Kant allows three arguments. The ontological argument is a necessity of the reason and the *a priori* ground of all other arguments. It is subjectively but not objectively valid. The cosmological argument gives empirical force to the ontological. The moral argument alone can give a complete Theology because it has the force of the other two arguments, and, moreover, grasps a divine and eternal line of conduct, in the light of which a moral Theology may be constructed. But Kant holds that the mere law is insufficient and needs to be brought into relation with happiness. The desire of happiness cooperates with respect for the holy law in enlisting obedience to the law without which happiness is impossible. Kant expresses the greatest confidence in his moral Theology. Its principles are 'so necessary that their denial leads one *ad absurdum logicum et practicum*, and to the surrender of one's understanding and freedom; indeed the subjective ground is so certain that nothing which rests upon objective grounds can be more securely established.' In none of his works are Kant's theological views so fully and clearly set forth as in these lectures.

Nowhere is Kant more interesting and surprising than in his treatment of rational and empirical psychology. In the first series he suggests that psychology may soon come to an independent position like physics, but later in L^2 and more explicitly in K^2 he seems to show empirical or experimental psychology to be an absolute impossibility. In the first series soul is not a mere subjective form but a substance which we know immediately. Kant attempts to prove *a priori* that soul is a substance, and concludes: "Die Seele ist eine einfache Substanz, also kann sie nicht erzeugt werden." This drift does not appear to be quite consistent; although when we consider Kant's doctrine of Apperception in his later lectures it is clear that the above position is not fully surrendered. Both in the first and second editions of the Kritik it is held that apperception precedes every arrangement of ideas, but in these lectures it is treated as self-consciousness, an independent power of the mind not in any way subject to external causes and yet making all distinctions among perceptions. Kant distinguishes pure from empirical apperception and holds that in pure apperception the *ego* is a direct object of contemplation. "The thinking subject must distinguish itself as phenomenon from itself as noumenon, and upon this rests the entire doctrine of freedom. Kant also uses his doctrine of apperception to establish the fundament that truth and falsehood inhere in judgment only, and that judgment is the initial activity of the mind. In all this, Kant seems to drift from the empirical standpoint, and precisely the same is seen in his handling of evolutionary problems. In the early MSS. Kant states the law of biological continuity in about the same language as Aristotle and Locke, but seems to reply to Locke's continuum, and to regard biological continuity and transformation in the evolutional sense as a chimæra in natural science. In L^2 Kant repudiates the notion that

reason or understanding can be attributed of the lower animals, and strongly defends both a quantitative and qualitative distinction between man and brute. In the chapter on rational psychology, K^2, Kant enters upon the *pro* and *contra* of preformation and epigenesis. Kant seems to be acquainted with the theory of Wolff, and decides against it in favor of preformation, which he holds to be impregnable. This decision is in harmony with Kant's belief in the preexistence of the soul, concerning which, like Plato, Cudworth and Locke, he seems to have very few doubts. Nowhere in these lectures does Kant recognize a transmutation of species or connect man with the lower animals. We cannot regard Professor Heinze's work as other than an important service and contribution to the Kantean philosophy. The most striking points are undoubtedly Kant's devotion to and faith in metaphysical procedure, his pronounced dogmatism before and especially after the publication of the Kritik, and the intensely practical purpose that dominates his entire speculation. The MS. K^2 is so valuable both as a general introduction to philosophy and to Kant's own views that we would strongly urge its publication, with introduction and notes by some competent hand.

MATTOON M. CURTIS.

IX.—NEW BOOKS.

Apparitions and Thought-Transference. An Examination of the Evidence for Telepathy. By FRANK PODMORE. London: Walter Scott, 1894. Pp. xiv., 395.

THIS book is to be commended to those who desire a clear and compact account of the method and results of the Psychical Society. It is written in a sober and circumspect spirit, with large allowance for the manifold traps and pitfalls which beset such enquiries, and without the slightest tinge of rhetorical exaggeration. The author confesses in his preface that the evidence "is as yet hardly adequate for the establishment of telepathy as a fact in nature, and leaves much to be desired for the elucidation of the laws under which it operates." He attaches most importance to the experiments in thought-transference; and lays special stress on the peculiarly distinct nature of the results in the case of hypnotised patients. As regards spontaneous thought-transference, he expresses himself with a certain sceptical reserve. "It is not claimed that the evidence reviewed even in its entirety is by itself sufficient to demonstrate the possibility of the affection of one mind by another at a distance. The main proof of such affection is based on the experiments already described, to which the spontaneous evidence so far adduced must be regarded as illustrative and in some degree auxiliary." We gather that Mr Podmore considers the case for thought-transference under experimental conditions as fairly well established. The fact that this is the general impression left on a mind so cautious and acute as his, is worth consideration. Perhaps, however, he does not make sufficient allowance for the loose nature of these psychical, as compared with physical, experiments; it is impossible, or at least very difficult, to take the same liberties with persons as with inert matter. It is difficult to gain an assurance that conditions essentially affecting the result have not escaped even the most careful observation. However, it should be distinctly admitted that on the whole the Psychical Society has made out a strong provisional case for the occurrence of "communication between mind and mind otherwise than through the known channels of the senses." They have supplied to those interested in such questions a reasonable ground and motive for following up their investigations, with the view of either finally arriving at positive results in such a way as to compel conviction in all reasonable minds; or of definitely discovering the sources of their error. In either case, they will have made a substantial and valuable contribution to our knowledge; in the first case, to that alleged department of it which has been called Psychical Research; in the second, to the older study which is known as Psychology.

An Introduction to Comparative Psychology. By C. LLOYD MORGAN, Principal of University College, Bristol. London: Walter Scott, 1894. Pp. xiv, 382.

"My central object in this work is to discuss the relation of the psychology of man to that of the higher animals, since such a discussion forms in my opinion the best introduction to Comparative Psychology. A secondary object, subordinate indeed, yet forming an integral part of my plan, is to consider the place of consciousness in nature, the relation of psychical evolution to psychical and biological evolution, and the light which comparative psychology throws on certain philosophical problems." Mr Lloyd Morgan writes with all his usual clearness and charm of style. His book is admirably adapted to arouse in the general reader an interest in psychological topics. It fulfils in an almost ideal manner the purpose of the Contemporary Science Series, to which it belongs. But the work has also some claim on the attention of the psychological specialist. Mr Morgan records some interesting and valuable experiments on the mental condition and development of chicks and ducklings hatched in an incubator, and bred in isolation. His results diverge in important respects from those previously obtained by Mr Spalding. Experience counts for more, and connate predisposition for less than Mr Spalding had supposed. But the main feature of the book is the clear and careful definition and discussion of the question whether there is any cogent evidence of *reasoning* in animals. The answer to this question, according to Mr Morgan, substantially coincides with the answer to another: Do animals perceive relations? On the ground of observation and experiment, he concludes that they do not. They have relational experience, inasmuch as the process of consciousness in them involves transition from one object to another. But there is no evidence that they have apprehension of relations as such. The perception of relation is reached as follows. "First a is focussed with c marginal, and then c is focussed with a marginal. Then, and then only, when each related term has in turn been focal to consciousness, can we make both marginal, and focus the relation itself." The evidence for the existence of such a process in animals retains its apparent cogency only when the investigator confines himself to loose and partial observation. When for this he substitutes systematic and detailed observation, with experimental control of the conditions, the facts are found to receive their most satisfactory explanation in association based on merely haphazard trial and failure, without insight into the relations involved.

Besides what expressly concerns animal intelligence, the book contains much matter of general psychological interest. Particular reference may be made to ch. XIX., on 'Selective Synthesis in Evolution.' One praiseworthy feature of Mr Morgan's work is that he recognises in a thoroughgoing way the significance of marginal or sub-conscious presentations.

Our notions of Number and Space. By HERBERT NICHOLS. Boston: Ginn and Co, 1894. Pp. vi., 201.

In this little book a number of experiments on tactile discrimination are described. Varying numbers of pin-points were applied to the skin at varying distances, arranged in varying forms, and the relations of these three categories of distance, number, and figure were investigated. The author argues from his results in favour of the theory that our notions of space extension are wholly expressions of, and have developed from, time extension. The conclusions are arranged at the end of the book in the

form of 109 propositions, or as the author calls them, "laws." One experiment may be mentioned; a suggestion is made to an individual that he is being touched with two pin-points when only one is being used, and an illusory perception of two touches occurs; the individual is asked for a judgment of the distance apart of the two impressions in various parts of the body, and the distance given for each part is found to be approximately that at which two points are perceived as one on that part by the ordinary method of Weber. Unfortunately it is not clearly stated whether these observations were tried on more than one individual.

Lectures on Human and Animal Psychology. By W. WUNDT. Translated from the Second German Edition by J. E. CREIGHTON and E. B. TITCHENER. London: Swan Sonnenschein and Co. New York: Macmillan and Co., 1894. Pp. x., 454.

"The present volume is the first of Professor Wundt's writings to be made generally accessible to the English-speaking public. Its comparatively popular and introductory character will, it is hoped, render it especially acceptable both to those beginning the study of psychology, to whom the technicalities of the author's Grundzüge would present very considerable difficulties, and to workers in other departments of science who may desire some knowledge of the methods and results of the new psychological movement" (Translators' Preface).

The second German edition of this work has been recently noticed in these pages. The accuracy of the English version is sufficiently guaranteed by the names of the translators.

Les Gaspillages des Sociétés Modernes. Par J. NOVICOW. Paris: Félix Alcan, 1894. Pp. 336.

The author of this treatise is struck by the fact that if all the wealth of the world were equally divided amongst all human beings everyone would be very poor, and he sets himself to discover the causes and cure of this poverty. The causes he finds to consist in three fundamental errors; first, the confusion between wealth and money, giving rise to mercantilism and protection; secondly, the confusion between wealth and property, giving rise to social parasitism and the spirit of conquest; thirdly, a false conception of the universe, or "misonéisme," giving rise to "gaspillages épouvantables." The cure for poverty, thinks M. Novicow, is more wealth; do away with sources of waste, and everyone will be richer. There is of course an element of truth in this, but to judge from this book the author has not yet passed the Pons Asinorum of Social Arithmetic: i.e. that it is unavailing to increase your divisor unless you can also hold your dividend in check. The main sources of waste are to be remedied only by an international federation of European States. The argument is complex. The first step is that those organisms survive which are best adapted to their environment; e.g. if you throw a man into a heated furnace he is not adapted to his environment and will immediately be resolved into his elements (p. 10). The second step is the importance of time in adaptation (ch. III.); the more time we waste the less capable we are of adapting ourselves to our environment. Finally, a great deal of time would be saved by an international federation, and if the European nations are to survive they must recognize their true interests in it. On his way to this conclusion M. Novicow touches upon a good many subjects, including the Manchester Ship Canal, Mr Charles Pearson and

the Chinese, and Socialism. The latter he holds to be valuable only in so far as it makes for the federation; in other respects it is a tissue of contradictions and chimæras.

H. DENDY.

La Vie Sociale, la Morale et le Progrès. Essai de conception expérimentale. Par le DR JULIEN PIOGER. Paris: Felix Alcan, 1894. Pp. 256.

A work treating of social science on strict analogy with biology. As the functions of an individual are to be explained by the nature of his organism, so each society is to be explained by the character of its organization. *Labour* is to social life what *function* is to life in general. "Labour results from the activity of man as function proceeds from the activity of the anatomic elements. Labour moreover is regulated, determined, by the social organization precisely as the functional activity of the anatomic element depends upon the biological organization. The division of labour with all its consequences—differentiation in individuals, variations in social organizations, interactions (répercussions) between members of each social organism—is to be explained by the necessarily variable effect of the distribution of incidental actions or influences, and represents the true source of determinism in social affairs" (p. 27). With this conception as his basis, le docteur Pioger proceeds to its more detailed application; discusses the nature of a society and the social function; propounds a 'theory of socialization' (as equivalent to organization), of sociability (as a species of extended sensibility), of morality (as reducible to the notion of solidarity), of progress (as analogous to biological development); and finally lands out of his very general theorizing in the surprisingly particular conclusions that the suffrage must be modified and the laws of inheritance annulled.

Mémoire et Imagination (Peintres, Musiciens, Poètes et Orateurs). Par LUCIEN ARRÉAT. Paris: Felix Alcan, 1895. Pp. 171.

The second title might here with more justice have occupied the principal place, for the psychological argument of the relations of memory and imagination is but a very slight weft—sound enough however so far as it goes—to a pleasing intertexture of anecdotes concerning artists and of citations from their works and correspondence. The special *raison d'être* of the book, so far as psychological, seems to be to call attention to the large part played by the memory-images (whether motor, visual, or auditive) in creative imagination.

La Perception Extérieure et la Science Positive. Par F. MARTIN, Professeur agrégé de philosophie, Docteur ès lettres. Paris: Félix Alcan, 1894. Pp. 305.

From Thales to Socrates Science investigated the unknowable substance of things. From Socrates to Descartes it attempted to determine their essence. Since Descartes it has devoted itself exclusively to the study of the relations of phænomena in time. If we consider the development of the separate sciences, such as Astronomy, Physics, and Physiology, we find that they have passed through the same three stages in the same order. Thus the various sciences, in the course of their evolution, changed not merely their method but their object. Thales and Democritus sought the *material* cause of all, Aristotle and Socrates the *formal* and *final* causes,

while contemporary men of science seek the *efficient* causes or conditions of phænomena. The reason of this fact is to be found in an intellectual necessity. The development of science follows the same stages in inverse order as the development of perception in the individual mind. M. Martin's exposition of the development of perception is not very clear. Here it will be sufficient to say that the successive steps of the process consist in successive efforts on the part of an identical self-consciousness to maintain its own unity and harmony, as against the chaotic and conflicting multiplicity of its own sense-affections. The book is interesting and ingenious; but the attempt to trace the development of consciousness *a priori* is at least as artificial and arbitrary as that of Fichte.

L'Abstraction et son rôle dans l'éducation intellectuelle. Par F. QUEYRAT, Professeur de philosophie au collège de Mauriac. Paris: Félix Alcan, 1895. Pp. 140.

Distinguishes between *passive* abstraction, due to obliviscence and fusion of images, and *active* abstraction, depending on attention. Illustrates the diverse grades of the power of abstraction in different individuals and different races. Refers this diversity to three causes: heredity, natural capacity for attention, and education. Treats generally of the part played by abstraction in intellectual culture, and finally deals with the educational problem, How best to develop the faculty of abstraction. The book consists largely in quotations, and contains nothing that is not sufficiently familiar. Interest in Psychology must be far more widely diffused among the general public in France than in England, if we are to judge by the number of popular books on the subject.

Les états intellectuels dans la Mélancolie. Par G. DUMAS, Professeur agrégé de philosophie au collège Chaptal, Docteur en médecine. Paris: Félix Alcan, 1895. Pp. 142.

The author arrives at three principal conclusions: "(1) Melancholy does not exist as a mental entity; it resolves itself, on the one hand, into phænomena of sentience, on the other, into phænomena of arrest. (2) Melancholy may have either an intellectual or an organic origin; but in both cases the motor phænomena are prior to the sentient state or cœnæsthesia; and Melancholy is never anything other than consciousness of the bodily state. (3) Synthesis is the law of the intellectual states (ideas or images) which associate themselves with the cœnæsthesia, and this synthesis is logical. Of these three conclusions the two first are extremely probable, and the last is certain." As regards (1), it is not quite clear what the author means by a 'mental entity.' If he means an idea considered as existing in abstraction from all bodily conditions, he is of course right. But the proposition is surely trivial. As regards (2), the proposition that Melancholy is nothing but the consciousness of the bodily state, is ambiguous. The author connects it with the theory of the emotions advanced by Lange and James. Interpreted in this light, it must mean that the physiological correlate of Melancholy consists in sense-impressions arising from the state of the muscles and of the nutritive and secreting organs. The grand difficulty we find in this view is that it seems to treat the brain itself as if it were no part of the organism, and as if it ought to be as far as possible excluded from all share in its own proper business. Surely it is a viscus as important as the liver or the stomach; and its own state of innutrition and mal-nutrition, with the

consequent difficulty and retardation of all psycho-physiological process, must count as the primary bodily correlate of that pathological condition of consciousness which we call Melancholy. Ordinary melancholy due to such circumstances as the receipt of bad news, has also its primary bodily counterpart in the disturbance of brain-function corresponding to the obstruction of psychical activity. The third proposition seems to us, as to the author, certain. It should be said that the description of the phænomena of Melancholy is exceedingly clear and good.

La Logique Sociale. Par G. TARDE. Bibliothèque de Philosophie contemporaine. Félix Alcan, 1894. Pp. 464.

According to M. Tarde, who has a faculty for happy terms of expression, Sociology is a science which has succeeded in being baptized before its birth. On this point many people will be inclined to agree with him. At the same time it is often convenient to have a name in readiness for an expected child, and, although the laws which determine social development are as yet hidden for the most part in the womb of futurity, it is perhaps an advantage to have a name which will in some way suit them when at last they come into the light.

It is M. Tarde's opinion that the arrival of the little stranger, Sociology, has been delayed by the theories of Jurists and Economists. According to these gentlemen the distinctive characteristic of a society is that it is based on service or contract.

On the contrary, says M. Tarde, associations of human beings exist in which contract either explicit or implicit is entirely absent, and in which people hinder rather than serve each other.

A better definition of the fundamental and distinctive social bond is to say that it consists of *Imitation.* In a previous work on the Laws of Imitation M. Tarde has developed this idea with considerable fulness, and he tells us that his opinions on this point have met with a gratifying reception from the philosophic world. The present work is a complement of the Laws of Imitation, and is a further development of his method of interpreting the laws of social life. In order to arrive at an accurate interpretation of those complex phenomena we must discard the fashion of comparing society to a physiological organism.

He does not deny that the comparison has a certain amount of profundity and does something towards clearing our conception of what society really is. But he believes that it may be compared even more profitably with something else—to wit the human mind.

In accordance with this belief M. Tarde contends that Imitation occupies a position in the collective life of society similar to the position occupied by memory in the psychic life of the individual. But memory is only the foundation of our mental structure: the structure itself is the intellect, the feelings, the will. Accordingly in his book on the Laws of Imitation M. Tarde was merely dealing with the foundation on which social life reposes. In his present volume, *La Logique Sociale*, he discusses the social structure itself. Working on the analogy which he traces between social and mental phenomena, M. Tarde proceeds to show that the social equivalents of individual judgment and volition are discovery and invention. After establishing this equivalence and exhibiting its import and bearings, he attempts to trace the laws which determine the movements and manifestations of discovery and invention. In the performance of this difficult task M. Tarde is not content with a mere description of the manner in which discovery and invention have actually

manifested themselves in society; he even attempts to ascertain the only possible lines on which they can manifest themselves.

M. Tarde's method of arriving at this result is by an application of what he calls the rules of individual logic to the complex phenomena of the social world. It is true that in the application of these rules he has to widen what is usually accepted as the scope of logic. But he justifies this step by contending that the sphere of logic is at present too contracted. Logical method should embrace a consideration of the degrees of belief and desire. He considers that both belief and desire—the sources of social phenomena—are real quantities whose variations are essentially if not actually measurable. This enlargement of the field of logic opens up to its methods a wider range of usefulness. When these new methods are applied to elucidating the laws of social life, sociology loses its existing amorphous form and appears in its true character as Social Psychology. In other words the Sociologist is a Social Psychologist. His task is to interpret and discover the laws of the collective mind in the same manner, and to a considerable extent by the same methods, as the student of mental science elucidates the workings of the individual mind.

We cannot follow M. Tarde into details. He has unquestionably produced a stimulating and suggestive book. Sometimes he allows his passion for comprehensive generalisation to carry him outside the contents of his brief. But even where we cannot follow him he always offers food for reflection.

La Logique Sociale will undoubtedly enhance his reputation as a philosophic thinker. W. D. M.

Die Philosophie der Freiheit. Grundzüge einer modernen Weltanschauung. Von Dr RUDOLF STEINER. Berlin. Verlag von Emil Felber. 1894. London. Williams and Norgate. Pp. 229.

Dr Steiner believes that in spite of an apparent tendency to superficial Socialism prevalent in the present age, there is in human nature an abiding and resistless individualism,—a love of freedom—an independence. The justification of this opinion is the *raison d'être* of the Essay before us. On p. 8 Dr Steiner asks, What is the relation of Philosophy to the idea of Freedom, and how far can Freedom be realized by the individual agent? The answers to these two questions form the content of the two main divisions of the work, entitled respectively, The Science of Freedom, and the Reality of Freedom. Dr Steiner devotes the first part to a psychological analysis of the processes subordinate and co-ordinate to the act of willing. Knowing and willing are, he thinks, inseparable functions. Hence there is both a cognitive and a motive factor in all mental states. The opinions of Dr Steiner most relevant to the topic under discussion are to be found in sub-section VII., p. 100, entitled "Human Individuality"—"Die menschliche Individualität." The author here follows the usual lines of modern psychologists, comparing and connecting the percept, the image, and the concept.

We apprehend objective reality by means of perception and conception, while through the mental individual image, Vorstellung, we have the subjective representation of reality (p. 105). The act of subjectivizing through a particular image gives us the apprehension of individuality, makes us conscious, as it were, that the tree we are imagining is a tree we ourselves have seen in the concrete, and not a mere group of abstract attributes. The Subjective is the apprehension of Individuality, as contrasted with the Objective, which is the apprehension of Generality.

With the image of the concrete is associated a feeling of pleasure or pain—desire or aversion. This feeling is purely subjective and clings to the mental image, Vorstellung, while it is totally absent from the objective concept, Begriff. Human desire has for its goal the satisfaction of the individual, while it is quite uninterested in the abstract and general.

In Part II., Section XI. p. 168, we are first introduced to Dr Steiner's distinct enunciation of the philosophy of freedom, which he calls Monism, but which some would designate Anarchism pure and simple. Our author has, however, prepared us for his doctrine at the outset by accepting in Part I. Spinoza's position that freedom means a free necessity, but not a free choice, (p. 12). Hence each man is called upon to develop his own potentiality, as a rosebud is bound to become a rose. The principle of growth is entirely from within; there shall be no external stress, no authority, no subordination, nothing but the unhampered development of infinite potentiality.

The only concession that Dr Steiner will make to popular prejudice in favour of established law, order and government, is the reluctant admission that this complete state of freedom is not attainable at one stride. The human race must be habituated and educated up to the point of development at which it is capable of enjoying perfect freedom, and we need hardly say that this millennium stage has not yet been reached.

Untersuchungen über die verschiedenen Moralsysteme. Von Dr Karl Alexander Leimbach. Fulda: Druck u. Comm.-Verlag der Fuldaer Actiendruckerei, 1894. Pp. 125.

This pamphlet is a dissertation on the Logic or rather the Methodology of Casuistry. Moral truth is attainable by reasoning, and is *immediately* discerned in a moral judgment, or *mediately* in the conclusion of a moral syllogism. Dr Leimbach indicates his position by a quotation from Bolgeni; morality has no secrets because the principles by which man may distinguish right from wrong in conduct can be discovered by anyone. The problem of the moralist is therefore to find a criterion of truth, or at least a guide to the probable where truth is unattainable. The tract consists of four parts. The first part treats of the idea of Certainty, Opinion, Doubt and Safety.

In the second part are examined various moral systems, or methods by which the path of truth and duty may be ascertained amidst the doubts and perplexities of human life.

The preference is finally given to the so-called Probabilism, or method of weighing evidence in doubtful cases, where demonstration is impracticable. Parts three and four are devoted to the historical justification of this method, and some rules are given for its application in special cases.

At page 42 is discussed the relation of freedom to law. Dr Leimbach accepts the dictum of Leo XIII., supported by Holy Writ and other authorities, viz. that liberty is anterior to law. Law is the rule and measure of *free* action. It is evident therefore that that which is bound and regulated must have existed before that which limits and regulates. In the mind of the Divine Creator freedom and law are united in a self-determining Act, and the human creature partakes of the Divine freedom in conforming to the Divine Will. Faith and reason are therefore respectively the compass and rudder of human conduct.

Wesen und Entstehung des Gewissens; Eine Psychologie der Ethik. Von Dr THEODOR ELSENHANS. Leipzig: Verlag von Wilhelm Engelmann, 1894. Pp. 334.

This work is divided into two parts, the first of which, to p. 161, is historical. The remainder of the book is devoted to a systematic analysis of the genesis and function of Conscience from the standpoint of Contemporary Psychology.

The historical retrospect embraces chiefly the post-Kantian writers. It is not of much interest.

The second part is also disappointing; the author had led us to expect an original exposition of the function and origin of the conscience as a psychological activity, but there is little in his dissertation that has not been culled from sufficiently well-known modern authors. Dr Elsenhans' treatment of the Intuitional School of Moralists seems very belated to English readers who are familiar with the writings of Butler, Price, Martineau and Sidgwick, and he has nothing to add to the *a priori* doctrines of Kant. On p. 298 the two chief factors of the development of conscience are stated to be (1) Social Life, (2) Intelligence. The relations of the sentient organism to its social environment, and the intellectual power of forming a rational estimate of these relations. The one is the material and the other the form of the moral faculty. Dr Elsenhans maintains that the activity of the moral agent must be determined by the social conditions to which he is subjected. This position he establishes by showing how the common conscience of communities develops through the successive stages of civilization, the hunting, nomadic, agricultural, etc.

Die Gesetze und Elemente des wissenschaftlichen Denkens. Von Dr G. HEYMANS, Professor der Philosophie an der Universität zu Groningen. Bd. II., *Theorie des naturwissenschaftlichen Denkens.* Leiden: S. C. Van Doesburgh; and Leipzig: Otto Harrassowitz, 1894. Pp. 273–478.

The first instalment of this work, which treated of the Method and Presuppositions of Formal Logic and Mathematics, was briefly noticed in *Mind*, O. S., Vol. 15, p. 580. In this second and final volume the author deals with the Logic of Natural Science in general, and also specially of Mechanics. Perhaps the most interesting feature of his work is the investigation of the nature of Causality as a logical principle. He takes up the position that the nature of Causation ought not to be determined merely by consideration of causes actually discovered, for none of these perfectly satisfy the demands of science. We should rather consider the ideal which scientific inquirers set before themselves, when they aim at ultimate and adequate causal explanations. In the discussion of mechanical principles, Dr Heymans gives a fresh and interesting analysis of the import of the conception of absolute motion, and of the mixed *a priori* and *a posteriori* character of the law of inertia. Critical notice of the work will follow.

Schopenhauer. Ein Beitrag zur Psychologie der Metaphysik. Von RUDOLF LEHMANN. Berlin: Weidmannsche Buchhandlung, 1894. Pp. 200.

This interesting and suggestive little volume contains four chapters—Personality and Philosophy, Romanticism and Rationalism, Monism and Ethics, the Method of Schopenhauer—preceded by a brief introduction, in

which the author confesses to the fascination exerted over him through many years by the philosophy of Schopenhauer, until the spell was broken through the claims of practical life (irreconcilable with a quietistic and anti-evolutionary system of belief), and a study of Kantian Criticism unrefracted by Schopenhauerian glasses. Then came a period of reaction, in which Herr Lehmann turned with aversion from Metaphysics in general and Schopenhauer in particular, devoting himself exclusively to psychological and historico-literary studies. In the course of the latter the old interest revived, but in a new form. In the writer's words "Schopenhauer now became to me a problem, a problem appertaining to Psychology and the History of Culture, which must be resolved with the aid of both these sciences."

According to the author the character of Schopenhauer was formed by the in-working of two dominating tendencies. The natural organic instincts were of almost demonic strength, but counterpoised by an equally commanding energy—an insatiable craving to construe the world rationally, to resolve the objects environing him into "the pure forms of abstraction and of logical relations" and to fashion a new world from these forms.

His life and his philosophy are the expression of these fundamental impulses:—no rest, no peace, save in the domain of pure thought, disinterested artistic activity and *will-less* contemplation.—Of those who are impelled to *think* the world, the author remarks, there are two kinds—the careful painstaking investigator, and the developer of an intuitively-apprehended first principle. To the latter class belonged Schopenhauer. As was natural, the artist got the better of the cautious inductive reasoner, and everything was sacrificed to the symmetry of his own construction.

Even so original and independent a genius as Schopenhauer could not escape the intellectual conditions of his age. He appeared at a time when two opposing forces were contending for empire,—on the one hand science, based on exact physical enquiry, and a *critical* philosophical method in harmony therewith; on the other, long-repressed feeling, which reasserted its rights in a manner that threatened to reinstate as the guide of life mediaeval ideals and mystical fancies. This twofold influence is betrayed in the title of Schopenhauer's great work—"Die Welt als Wille *und* Vorstellung." Under "Wille" is masked the spirit of Romanticism, under "Vorstellung" that of Rationalism or Enlightenment. In one half the work we see the influence of Kant's *Kritik*, in the other that of great mystics and ascetics, and materialistic occultism. And these counter-tendencies are never reconciled.

Perhaps the most interesting section is that entitled "Monism and Ethics." Neo-Spinozism, with its monistic, aesthetic, optimistic characters—the dominant intellectual note of the age of Goethe—is well described. Schopenhauer drew in the *monism* as his vital air, but despite his aesthetic bias declined the poetic optimism. The moralist got the better of the artist. Now as Herr Lehmann excellently remarks: "every moralising habit of thought tends naturally to Pessimism, because it never sees its demands satisfied in the actual world and life." There follows a brief but keen criticism of the Schopenhauerian doctrine of the will and pessimistic theory. One undeniable merit of Schopenhauer's is pointed out, that for the first time Asceticism is recognised as a problem of philosophy—only unfortunately inadequately resolved. Schopenhauer's understanding and misunderstanding of Kant are well shown. Now Schopenhauer, unlike his predecessor, holds that metaphysical knowledge *is* possible, only the knowledge which carries beyond the sphere of

possible experience is *empirical*. The world without must be interpreted by the world within; which comes to this, that the ultimate problems of Being are handed over to psychology: in short, Schopenhauer confounds psychological and metaphysical knowledge!

In fine, Psychology and Epistemology afford the material for his system. "The carrying over of their elements into the transcendent is that which one may call the philosophical method of Schopenhauer, the metaphysical hypostasis of the abstract concepts borrowed from those sciences its essential, nay sole, auxiliary,"—the bond of unity being emotional, an efflux from the personality of the constructive thinker.—An analysis of other metaphysical systems would reveal few further sources of error and contradiction. Hence an analysis of that of Schopenhauer may be regarded as a typical contribution to the psychology of Metaphysics.

Lehrbuch der allgemeinen Psychologie. Von Dr. J. REHMKE, Professor der Philosophie zu Greifswald. Hamburg und Leipzig: Leopold Voss, 1894. Pp. 579.

A very elaborate and also a very diffuse examination of the fundamental psychological principles. The author first treats of the nature of the mind and of its relation to the body and to the world of external objects; then of the constitution of a psychosis, or *Seelenaugenblick*, as he terms it; this is analysed into object-consciousness, state-consciousness (zuständliches Bewusstsein), and causal consciousness. Each of these then receives separate treatment. Emphasis is throughout laid on the necessary implication of a subject in all consciousness. Finally, the various phases of mental process are considered under the heads: Immediate Time-consciousness; Thinking; Memory; Remembrance; Mental Construction; Action; Personality. The book is somewhat difficult to read from the dryness and wordiness of the style; but it contains enough valuable matter to make it worthy of the attention of those who are specially interested in the questions with which it deals.

Peregrinazioni Psicologiche. Del PROF. TITO VIGNOLI. Milano: Ulrico Hoepli, 1895. Pp. 404.

A series of papers on topics of varying psychological interest, now collected for the first time but written between the years 1883—94, the majority for the *Rivista di Filosofia Scientifica* or for the R. Istituto Lombardo. Among the subjects treated are "The heredity of the moral dispositions" (argues a moral and mental, as a physical, continuity between man and the lower animals); "The psychical act of attention in the animal kingdom" (power of introspection the distinguishing feature of man as compared with other animals); "Unconscious intervals in a coordinated series of psychical acts"; "A sexual psychology" (discusses mental and physical differences between men and women) etc., etc. The distinguishing feature of Prof. Vignoli's method is the frequent comparative use of the psychology of the lower animals.

RECEIVED also:—

J. Venn, *Symbolic Logic*, Second Edition, Revised and Rewritten, London, Macmillan and Co., 1894, pp. xxxviii., 540.

C. L. Morgan, *Psychology for Teachers*, London, Edward Arnold, 1894, pp. x., 246.

G. S. Fullerton, *The Philosophy of Spinoza*, New York, Henry Holt and Co., 1894, pp. 358.

J. W. Thomas, *Spiritual Law in the Natural World*, London, Longmans, Green and Co., 1894, pp. xv., 408.

J. H. Jackson, *The Factors of Insanities*, London, Danks and Son, 1894, pp. 25.

G. Hirth, *Les Localisations Cérébrales en Psychologie* (traduit de l'Allemand par Lucien Arréat), Paris, Félix Alcan, 1895, pp. viii., 133.

G. Beaulavon and D. Parodi, *Œuvres Choisies de Berkeley* (traduit de l'Anglais), I., Paris, Félix Alcan, 1895, pp. xxviii., 284.

A. Hamon, *Psychologie du Militaire Professionnel*, Paris, Bureaux de la Revue Socialiste, 1894, pp. 201.

B. Conta, *Théorie de l'Ondulation Universelle*, Paris, Félix Alcan, 1895, pp. xxii., 216.

D. Wetterhan, *Das Verhältnis der Philosophie zu der empirischen Wissenschaft von der Natur*, Leipzig, Wilhelm Engelmann, 1894, pp. viii., 110.

G. F. James, *Thomas Hill Green und der Utilitarismus*, Halle a. S., Max Niemeyer, 1894, pp. 37.

E. Martinak, *Die Logik John Locke's*, Halle a. S., Max Niemeyer, 1894, pp. 148.

E. Meyer, *Humes und Berkeleys Philosophie der Mathematik*, Halle a. S. Max Niemeyer, 1894, pp. 57.

J. Rehmke, *Unsere Gewissheit von der Aussenwelt*, Heilbronn, E. Salzer, 1894, pp. 48.

H. Romundt, *Ein Band der Geister*, Leipsic, C. G. Naumann, 1895, pp. 129.

C. M. Giessler, *Wegweiser zu einer Psychologie des Geruches*, Hamburg and Leipsic, Leopold Voss, 1894, pp. 77.

A. Comte, *Der Positivismus in seinem Wesen und seiner Bedeutung* (übersetzt von E. Roschlau), Leipsic, O. R. Reisland, 1894, pp. xii., 384.

A. P. Mauro, *Poesie Giovanili*, Catania, Reale Tipografia Pansini, 1894, pp. 14.

N. R. D'Alfonso, *Principii di Logica Reale*, Roma, G. B. Paravia, E. C., 1894, pp. 70.

X.—PHILOSOPHICAL PERIODICALS.

In the INTERNATIONAL JOURNAL OF ETHICS for October, **Professor Sidgwick** publishes an address on "Luxury"; of which the most important practical conclusion—that luxury is needed for artistic and æsthetic development—is rather affirmed than proved. **Mr F. H. Bradley**, writing on "The Limits of Individual and National self-sacrifice," presents combatively some deductions of a bellicose type from his principle that "the development of human nature" is the ultimate end of action; he has no doubt that "the meek will *not* inherit the earth." **Miss Gilliland** discourses on "Woman in the Community and in the Family"; she hopes, by reducing the number of a woman's child-bearing years, by persuading men to "take some part in the rearing and personal tending" of their children, and by introducing "cooperative dwellings," to enable a woman "to devote herself as a free human being" both "to the service of her family and to the service of humanity." **Mr Edward Montgomery** writes on "Ethics and Biology": his chief point is that Biology shows the "fundamental and essential activity of life" to lie in the "life of outside relations," as contrasted with the gratification of appetites which constitutes "entodermic life": and thus leads up to the ethical ideal. **Professor Ferri** writes on "National Character and Classicism in Italian Philosophy." **Miss E. E. C. Jones** gives a careful and well considered defence of "Rational Hedonism" against some recent assailants. There is an interesting discussion of "The Practical Value of Ethics" by **Mr J. S. Mackenzie.**

THE PHILOSOPHICAL REVIEW. Vol. III. No. 6. **J. G. Schurman.** 'The Consciousness of Moral Obligation.' [The sense of obligation is dependent upon an intellectual act, the recognition of rightness; but is itself an unique, unanalysable emotional experience, a simple feeling. It is in essence altogether subjective; a function of reason, which is the *differentia* of man from the animals. But it appears rarely, if ever, in this abstract form: it is objectively overlaid with piety, devotion, sympathy, propriety, prudence. Which is higher: the concrete, spontaneous, mixed, or the reflective, abstract, pure form? Probably the former, all things considered. Thus it would not be well to substitute secular for religious moral instruction in schools: that would mean that we tried to influence children by abstractions, like the categorical imperative (!). Recognising that the sense of obligation is thus elemental and subjective, and that it consists in free homage to a law or ideal of goodness, we can appreciate systems. The Intuitionalists or Transcendentalists are right in taking as the heart of the matter the sense of unconditional duty; wrong in regarding the statement of the fact as an explanation or vindication of it. The Empiricists are right in what they say of the emergence of the sense of obligation in consciousness: wrong in identifying the ante-

cedents, associates and reinforcements of the feeling with that itself. The Theologists make just the same mistake. But we may modify their view: our native sense of obligation being given as ultimate, we may conceive the moral ideal as the divinely intended goal and type of humanity,—the ground of obligation continuing subjective.] **S. W. Dyde.** 'Hegel's Conception of Freedom.' [Schwegler and von Hartmann criticise Hegel on the ground that his philosophical theory sacrifices the ethical freedom of the individual. But an analysis of the *Philosophy of Right* shows us that while Hegel makes short work of freedom in the sense given it by Hobbes and Rousseau he indefinitely deepens the idea of freedom by proving that man is not really free except as he identifies himself with the state as the revelation of the divine. The question of the critics must now be phrased: Does spirit or reason exhaust itself in the logical evolution of a rational constitution? The answer implies knowledge of Hegel's view of the evolution of spirit, in the Introduction to the *Philosophy of History*. That gained, we can raise again the original issue. If it is freedom not only to apprehend the reason in one's objective relations, but in conduct to identify oneself with this realised reason, then Hegel recognised, more, is the author of this concept of individual freedom. If freedom means possibility of the creation of a higher reason and of origination of a higher spirit, Hegel lends no countenance to the interpretation.—Reason of the return to Kant. Hegel and von Hartmann. Mr Bradley and sentience. Time and the Hegelian 'process' of the realisation of spirit.] **W. B. Elkin.** 'Relation of the Treatise of Human Nature (Book I.) to the Inquiry concerning Human Understanding.' [A careful, if somewhat colourless comparison: summary of a thesis for the philosophical doctorate. The standpoint of the two works is logically and practically the same. The Appendix of the *Treatise* influences the *Inquiry* but little. If read alone, the *Treatise* is sceptical, the *Inquiry* agnostic; but the whole Hume is sceptical.] **E. Adickes.** 'German Kantian Bibliography, X.' [Important essay on Fichte.—Bauerschubert, Bendavid, Feuerbach, Krug, Dolz, Erhard.] **J. H. Hyslop.** 'Discussion: the Ego, Causality and Freedom.' [Analysis of Neo-Libertarianism, in reply to Dewey: *Phil. Rev.* III. 3. Dewey reduces libertarianism to indifferentism, in order to repudiate the latter for determinism. But there are several forms of indifferentism, and different kinds of determinism.] Reviews of Books. Summaries of Articles. Notices of New Books. Notes. Index. Vol. III. No. 7. **J. Royce.** 'The external World and the Social Consciousness.' ["A general sketch," in Professor Royce's pleasant popular style, "of the psychological origin of our concept of the categories of what we are accustomed to call external reality." The social factor in our notion of the facts of the external world, and in the meaning we attach to externality; psychogenesis of this concept.] **J. Watson.** 'The Problem of Hegel.' [Criticism of D. J. Hill's *Genetic Philosophy*. Plea for the impartial consideration of Hegel as the mouthpiece of philosophy in the early part of the century; historical sketch of the literary development of the epoch. The advance of thought from Kant to Hegel: the latter stands to the former somewhat as Aristotle stood to Plato. Analysis of the first part of the Hegelian system, the Logic; relation to this of the *Philosophy of Nature* and the *Philosophy of Mind*.] **A. Seth.** 'Epistemology and Ontology.' [Reply to Ritchie's article on the "Relation of Metaphysics to Epistemology." Epistemology (1) investigates the ultimate nature of proof or evidence, and (2) analyses the conceptions which form the structure of knowledge. Ontology is a theory of the nature or mode of existence of that all-comprehensive Experience or Being which sustains and by completing

explains our fragmentary and contradictory experiences.] **E. Adickes.** 'German Kantian Bibliography, IX.' [Niemeyer, Pappenheimer, L. I. Snell, Tiedemann, Venturini, Ammon, Bauer.] Reviews of Books. Summaries of Articles. Notices of New Books.

BRAIN.—Part LXVIII. **H. J. Berkeley.** 'The Finer Anatomy of the Infundibular Region of the Cerebrum, including the Pituitary Gland.' **W. L. Andriezen.** 'On some of the Newer Aspects of the Pathology of Insanity.' **W. A. Turner and W. Bulloch.** 'Observations upon the Central Relations of the Vago-Glosso-Pharyngeal, Vago-Accessory and Hypoglossal Nerves, from the Study of a Case of Bulbar Paralysis.'

REVUE PHILOSOPHIQUE. Sept. 1894. **G. Mouret.** 'Le problème logique de l'infini. II. Valeur et Grandeur.' **Amelineau.** 'L'idée de l'âme dans l'ancienne Egypte. Sa genèse et son développement.' [Account of the gradual 'spiritualization' of the primitive notion of an attenuated but still material "double."] *Observations et documents.* 'De la durée du temps dans le rêve.—Analyses, etc.' October. **A. Binet et V. Henri.** 'De la suggestibilité naturelle chez les enfants.' [Account of experiments made with children of varying ages to ascertain the extent to which a simple suggestion may bias or overrule the judgment.] **H. Lachelier.** 'Théorie du jugement et du raisonnement déductif dans la "Logique" de Wundt.' [A simple résumé without critical comment.] **V. Egger.** 'Compréhension et contiguité.' [A further development of views expressed in the July and August Nos., 1893. There is no judgment of comprehension or of contiguity, as radically distinct from the judgment of extension or of resemblance. "The judgment, deriving from association by resemblance, remains, in ultimate analysis, confined to resemblance; and the relations of extension, being alone reducible to relations of resemblance, are also the only relations with which the judgment is directly concerned."] **Th. Ribot.** 'Recherches sur la mémoire affective.' [Under the head of "mémoire affective" M. Ribot treats of the recall to memory of tastes and smells, of organic sensations, of pleasures and pains, and of emotions and passions. Following the method now so much in vogue, of making a consensus of popular opinion by the dissemination of printed questions, he arrives at the conclusions;—(1) that there exists an 'affective' type of memory as clear and distinct as the visual, auditive, or motor type; (2) that besides a general affective type, there are partial types; and (3) that the (affective) reminiscence depends on the cerebral and internal conditions rather than on the actual original impression.—The fact that the recall of past events often reinduces an emotion identical with that which accompanied them, may perhaps be taken as less conclusive evidence than M. Ribot assumes it, since it may be argued that the reinduced emotions lack the marks proper to memory-images.] *Notes et discussions.* [M. Naville criticizes the distinction between psychological and physical laws drawn by M. Weber in the June number.] November. **Dugas.** 'La mémoire brute et la mémoire organisée.' [Discusses the relation and difference between the mechanical memory, the indiscriminate recall of past images so often conspicuously strong in idiots, and the memory proper to the thinker, when the recall is by way of intelligent connexion and selection.] **R. de la Grasserie.** 'De l'importance des langues sauvages au point de vue psychologique.' [Dwells on the psychological significance of those languages in which the parts of speech are still undistinguished, and meaning hangs on mere order of arrangement. Syncretism and subjectivity distinguishing features of primitive languages.] **G. Richard.** 'La discussion judiciaire et l'état de droit.—Revue Générale, etc.'

REVUE DE MÉTAPHYSIQUE ET DE MORALE.—Deuxième Année, No. 5. **G. Simmel.** 'Le Problème de la Sociologie.' [If Sociology is to be anything more than a mere method applied in other sciences, or merely a new term applied to the whole complex of mental sciences, we must find for it a definite and distinctive subject-matter. This subject-matter is, according to Simmel, the function of social combination, considered formally in abstraction from the special aims or interests of this or that society.] **É. Le Roy et G. Vincent.** 'Sur la Méthode Mathématique.' [There are two groups of mathematical sciences, (1) Theory of pure quantity, considered abstractly through reason alone, or Analysis, (2) Application of analytical forms to the rational representation of sensible quantities, or applied mathematics, comprehending Geometry, Mechanics and Analytic Physics. The method of analysis is the subject of the present article. The conclusions reached are: (1) The object of analysis is a pure abstraction, a form without any determinate material content. (2) An analytic truth is like a mould or empty form of which we demonstrate the necessity; to derive from it a proposition relative to the real world we have only to give it a filling in from the matter furnished by experience. (3) The human mind possesses only one primitive mathematical datum: the unit. On this datum it operates in various fashions. It thus creates the series of analytic concepts; and, by identification of these various modes of construction, the series of analytic truths.] **J. Weber.** 'Une Étude Réaliste de l'Acte et ses Conséquences Morales.' [Unpredictable spontaneity belongs to the essence of action as such. Writer follows the lines of Bergson; but he out-Herods Herod, and deduces very paradoxical consequences from the general doctrine.] Discussions &c. No. 6. **G. Remacle.** 'Du Rapport entre la Pensée et le Réel.' [Re-asserts, as against M. Fouillée's criticism, the position of the writer that knowledge, in the strict sense of the word, is confined to immediate momentary consciousness. All other so-called knowledge, including that of past states of our own consciousness, transforms its object in knowing it, and ought rather to be regarded as Art than as Science.] **G. Noël.** 'La Logique de Hegel: la Science de l'Essence' (Suite). [Treats of the categories of Essence and of the transition to the world of external phænomena.] **É. Le Roy et G. Vincent.** 'Sur la Méthode Mathématique' (Suite et fin). [Discusses the methods of Geometry, Mechanics and Physics, as applications of analytic formulæ.] Discussions. **G. Lechalas.** 'Note sur la nature du raisonnement mathématique.' [Criticises the article of M. Poincaré in No. 4 of this Review.] Notes Critiques &c.

PHILOSOPHISCHE STUDIEN. Bd. X. Heft 4. **W. Wundt.** 'Zur Beurtheilung der zusammengesetzten Reactionen. E. Kraepelin und J. Merkel. Beobachtungen bei zusammengesetzten Reactionen.' [Kuelpe, in his recently published *Grundriss der Psychologie*, subjected the methods and results of compound reaction-time experimentation to a severe criticism. Wundt here defends them. A point of especial interest is the question whether in choice-reactions there is given to introspection a special choosing process. Wundt, Kraepelin and Merkel answer in the affirmative: Kuelpe suggests a momentary lapse of memory as the explanation of the lengthened time. New experiments are promised. They will be interesting, since analysis of the simple reaction has now been carried so far that whatever comes out will have some claim to finality.] **J. Merkel.** 'Die Abhängigkeit zwischen Reiz und Empfindung' (concluded). [The relation between stimulus and estimation of sensation; lower deviations from Weber's law, etc. It is to be hoped that this long and valuable series of articles may be reprinted in book form, and their conclusions

definitely formulated in a summary. At present, unimportant and important are somewhat irritatingly intermixed.] **F. Kiesow.** 'Beiträge zur physiologischen Psychologie des Geschmackssinnes, II.' [Taste qualities: double sensations and associations: contrast—discovered, as against Oehrwall; salt contrasts with sweet, salt with acid, sweet with acid; there is no contrast of salt with bitter, sweet with bitter, and acid with bitter.] **J. Cohn.** 'Experimentelle Untersuchungen über die Gefühlsbetonung der Farben, Helligkeiten und ihrer Combinationen.' [The author finds that the more saturated colour is the more pleasing; and that yellow is the most generally unpleasant of a series of saturated colours. Neither result can claim universal validity. A combination of two colours is more pleasant, the farther removed the components are from one another. So with brightnesses, within the limits tested, 1 and 40. This is probably true in general. White is pleasanter than grey or black: the range of this judgment is doubtful. The law of brightness-combination holds if a colour and a brightness, or two colours are compared. The article contains good remarks on the affective judgment.] **A. Wenzel.** 'Beiträge zur Logik der Socialwirthschaftslehre, II.' [Social law.]

VIERTELJAHRSSCHRIFT FÜR WISSENSCHAFTLICHE PHILOSOPHIE.—XVIII. Jahrgang, Heft iv. **T. Achelis.** 'Zur buddhistischen Psychologie.' [An interesting comparison between Buddhist and certain phases of modern Psychology.] **R. Avenarius.** 'Bemerkungen zum Begriff des Gegenstandes der Psychologie.' (Zweiter Artikel.) [All objects of knowledge are *ipso facto* objects of psychological science, if and so far as they are considered in their logical dependence on the individual subject which is cognisant of them. The general position closely resembles that taken up by Dr Ward. Avenarius however diverges from Ward inasmuch as he regards the relation to the 'system C,' viz. to the brain process correlated with conscious process, as being for psychological purposes equivalent to, and capable of substitution for, the relation to a subject. Apart from this difference, the careful analysis of Avenarius constitutes a strong corroboration of Dr Ward's general definition of the scope of Psychology. He appears however to be unacquainted with Ward's work.] **A. Marty.** 'Ueber subjectlose Sätze und das Verhältniss der Grammatik zu Logik und Psychologie.' (Fünfter Artikel.) [(1) Criticises the views of Puls, Erdmann and Wundt, on the nature of impersonal propositions. Among other points, Marty contests Erdmann's position that a question is a judgment. Perhaps he is right as against the arguments of his opponent: but does not a question involve the Yes-No consciousness, inasmuch as it involves the suspension of the mind between Yes and No? (2) Criticises the views of Sigwart and Erdmann on the nature of existential propositions. The point debated is whether existence can properly be regarded as a predicate.] Anzeigen &c.

PHILOSOPHISCHE MONATSHEFTE.—Bd. XXX., Heft 7 and 8. **P. Natorp.** 'Ueber Socrates.' [Takes its point of departure in Karl Joël's book, *Der echte und der Xenophontische Sokrates.* Natorp would ascribe less weight to the authority of Aristotle, and more to that of Plato in the *Apology* and in the *Crito*, than Joël does. He regards it as possible to disengage in a large measure the Socratic element in Plato's teaching.] **K. Vorländer.** 'Ethischer Rigorismus und sittliche Schönheit, II.' [Ethical rigorism is justified as a necessity of ethical method. In nearly all the passages of Kant, where his ethical rigorism finds expression, this necessity of method is either explicitly indicated or implied. Schiller also has throughout accepted ethical rigorism in this methodological sense. What he has done is to supplement the ethical view by an æsthetic view which in no wise

contradicts it.] Among RECENSIONEN there is a long notice of Volkelt's *Vorträge zur Einführung in die Philosophie der Gegenwart*. Bd. XXX., Heft 9 and 10. **O. Kleinenberg.** 'Das System der Künste.' [There are a dozen arts; six inductive, having their point of departure in concrete detail; and six deductive, having their point of departure in a universal plan or ideal. Painting is an inductive art, the drama a deductive one.] **W. Enoch.** 'Transcendentalpsychologie.' [Contains an appreciative account of a work by the Küstrin philosopher, Otto Schneider, entitled: *Transcendentalpsychologie, ein kritisch-philosophischer Entwurf.*] **K. Vorländer.** 'Ethischer Rigorismus und sittliche Schönheit, III.' [Schiller has worked out the relation between the æsthetic and moral view of Beauty on strictly Kantian lines.] Litteraturbericht &c.

PHILOSOPHISCHES JAHRBUCH. Bd. VII. Heft 4. **Jos. Maassen.** 'Plato's notion of Deity' (continued). [Plato's God is an intelligent personal Being; acting according to eternal laws, founded upon His essence, and consequently not superior to Him. He is eternal; the world, which springs from Him, is not so: He is immutable, and change would be against His nature. The gods can have no human passions; painters and poets have given a false and misleading idea of Him. The Deity is eternally in a state of bliss; He comprises all things, is just, loves justice, hates what is wrong, punishes wickedness, cannot be pacified by gifts, and is supremely wise. Wisdom, the gift of God, is the highest virtue of all.] **Dr C. Gutberlet.** 'On the mensurability of psychical acts' (continued). [The article is a summary and an examination of the objections of (1) Elsas, (2) Ebbinghaus, and (3) Wahle. (1) *A.* "A psychical act cannot be measured, since one cannot be added to, or subtracted from, another; it is only figuratively that one is said to be greater or less."—But in Fechner's admeasurements it is only the greater or smaller intensity of the *object* (e.g. light felt) that is really measured; and this is no figure of speech. *B.* "We cannot admit it as proved that the magnitude of any sensation increases by the addition of its parts, nor that it is possible to find out the sum of the whole."—But, as, though we cannot add together different movements, we can measure the resulting velocity, so, while each element of the sensation may be different, we can measure the increase of intensity of the whole. (2) Ebbinghaus' objection fails, because his comparison between distances and sensations is not accurate. (3) "Sensations," says Wahle, "have no intensity, that is, no measurable intensity, since it would be necessary to apply in consciousness to one of them another which would be, say, half its intensity. And this is impossible."—But we can know that different lengths are exactly measurable, without applying a rule to them. A sound, a light, if doubled, may become as intense as another; so too we may think it as halved. One sensation certainly lasts twice, thrice, etc. as long as another; but to say exactly how much longer is hard.] **Prof. Tilm Pesch, S.J.** 'Dr Al. Schmid and the Theory of Cognition' (concluded). [The writer examines Dr Schmid's view of sensitive cognition; his affirmation that the external senses do not present us with noumenal but with phenomenal reality; his notion of general sense-presentations as contrasted with that of universal concepts; his attempt to bring Kant and Aristotle into agreement as to the existence of synthetical judgments *a priori;* his confusion between 'object' in the Kantian and in the Peripatetician sense; his historical review of the various theories of intellectual cognition; his opinion about the causality of the First Cause; and his doubts whether the reality of the external world, which he admits as possible, can be positively demonstrated to be true.] **Father C. Th. Isenkrahe.** 'Sense-

delusions and the Copernican theory.' [The article is partly an attack on F. Linsmeier, S.J. for going too far in the conclusions which he draws respecting this theory; they would go to destroy the value of the testimony of our senses, which he entirely gives up. His doctrine "that we ought to overlook it in face—not of an evident demonstration—but of a greater likelihood of the contrary to what it affirms," is denounced as unsafe. All so-called 'delusions of the senses' result from a false conclusion, rashly drawn from true premisses which the senses provide; either because we neglect to control one sense by another, or because we extend the conclusion farther than the domain of the senses. They, for instance, in the Copernican controversy, give us as a fact relative motion and immobility; where the absolute movement and immobility is, cannot be decided by their aid alone.]

RIVISTA ITALIANA DI FILOSOFIA. Sept.—Oct. **L. Ambrosi.** 'La classificazione dei sentimenti nella storia della filosofia.' [An historical survey of the various attempts at classifying feelings and emotions. These fall under one or other of the three broad classes, (1) attempts at classification preceding the proper discrimination between mere pleasure and pain and the emotions, passions, or desires deriving from it (Comprises Descartes, Spinoza and all classifications up to Kant. Bain also fails to observe the strict line of demarcation); (2) classifications of pleasures and pains by their accompanying phenomena (Kant, Hamilton, Mantegazza, Bouillier); (3) classifications of pleasures and pains independently of their objects (Dumont, Grote). The science of the future must follow on these latter lines, the great desideratum being a "general embryology" of pleasure and pain, showing the different modes of feeling corresponding to varying complexity of organisms.] **F. Ferri.** 'La scuola positiva di Diritto penale e *I nuovi orizzonti* di Enrico Ferri.—Bibliografia, etc.' Nov.—Dec. **G. Marchesini.** 'Saggio sul concetto monistico della continuità dinamica della psiche.' [Maintains the general dynamic continuity of consciousness as exhibited in the synthetic activity of attention, and discusses its manifestation in sensation, feeling and volition. Continuity directly proved by memory. This continuity is equivalent to unity; a unity not excluding, but underlying, the multiplicity of phenomena.] **F. Ferri.** 'La scuola positiva di Diritto penale e *I nuovi orizzonti* di Enrico Ferri.' **V. Di Giovanni.** 'Una lettura del Gioberti al Mamiani. Bibliografia etc.'

VAPROSI PHILOSOPHII I PSYCHOLOGII (Philosophical and Psychological Problems[1]). *Fifth year, Fourth number*, pp. 372. **F. A. Zelenogorskii.** 'The Philosophy of Gregory Savvitch Skovorod.' [This concluding article reviews Skovorod's idea of practical philosophy at great length. Skovorod divides the sciences which properly deal with man into medicinal, jurisprudential, and theological; among the last, Ethics is the proper domain of the philosopher. It is the science of happiness, which consists, not in external things, but in peace of mind, joy of the heart, and strength of will, which is obtained by resignation to the will of God. Man should act conformably to nature, which is the mainspring of all things; for it awakens desire, which is the source of science and progress. Tendency, desire, satisfaction, nature and God,—all this means the same; and whatever act makes against the happiness of our nature is a foolish act. This doctrine may be called Pantheism; but it is a Pantheism which

[1] The organ of the Psychological Society of Moscow; edited by Professors Grote and Lopatyn; appears five times a year: January, March, May, September and November.

admits a personal God, and human free-will.] **W. A. Wagner.** 'On the Psychological nature of instinct, as shown by the recent data of experimental physiology' (concluded). [The writer describes many experiments made with beheaded insects, and comes to the conclusion that amongst the Invertebrata, instinct is more followed in working than the impressions of the senses, which are very imperfect. Flies, butterflies, caterpillars, bees, etc., not only live from five hours to six days without a head, but perform every movement as in their normal state, until their death, which results either from the wound received, or from the fact that they can no longer be fed.] **W. S. Solovieff.** 'First Data of Ethics.' [That which properly distinguishes man from the brute is the feelings of shame and conscience. These two feelings speak a different language, but what they say amounts to the same. It may be formulated in the following dictate: What is not right is forbidden.] **N. J. Grote.** 'Of Time' (continued). [It is as impossible to measure thought, ideation, and things intellectual in general, by the flight of time, as it is impossible to measure them in space. If we concentrate our thought on an external object, the time seems short; if upon internal phenomena, it appears long. The feelings out of which our imaginary representation of length of time is made up, are impressions of psychical effort, proceeding from successive central innervations.] **A. A. Tokarskii.** 'Cognition and Will.' [There are three particular cases (*momenti*) in which free-will may to a certain extent, appear. I. In *Attention*, the will is at times not free; but at others it is. II. In *Choice* between two objects, it is sometimes necessary that the will be exerted freely. III. In *Emotions*, the will, taken as a vital force, begins to show itself. The writer winds up by a sort of Platonic dialogue, in which he sums up by means of familiar examples, the teaching of the modern French school as concerns the will.] **A. A. Kozloff.** 'Gustavus Teichmüller.' [According to Teichmüller there are only four general directions of philosophy: Positivism, Idealism, Materialism, and Leibnitz's theory that the contradiction between mind and matter is a mere delusion, both mind and matter being united in one and the same being.] **W. A. Goltseff.** 'The psychology of the "Idées-forces."' [The writer examines the theory of Fouillée, and his endeavour to prove the psychological existence of the "idées-forces."]

XI.—NOTES AND NEWS.

"HYPOTHETICALS IN A CONTEXT."

THERE is an interesting contradiction, in result, between Mr Johnson's answer and mine (in the previous No. of *Mind*) to the main question raised by "Lewis Carroll." Perhaps it may be removed, or minimised, in the following manner.

My contention is, not that the sentence 'If *A* is true, *B* is not true' must on all occasions mean something more than 'the conjunction of *A* with *B* is false,' but that in the context in which it is here placed, it requires to be taken in a less negative sense than this,—at least in the absence of a special warning that its meaning is to be thus limited.

As the consequent of a hypothetical, it is expressly given as *possibly false*, whereas the other hypothetical (2) is given as *certainly true*. The effect of this context, it seems to me, is to oblige us to decide the question (whether these sentences have compatible meanings) as *adversely* as possible, not as favourably as possible, to the truth of the consequent 'If *A*, then not *B*.' We are challenged to find the most, not the least, that is involved in the given propositions (1) and (2), and therefore, I think, we are bound to take them as premisses of a syllogism in the *modus tollens*, since (apart from certain restrictions convenient for some of the purposes of Symbolic Logic) they naturally bear this interpretation.

I admit that the case would be otherwise if, instead of 'If *C* is true, then if *A* is true, *B* is not true,' we were given '*A*, *B*, *C*, cannot be all true at once.' It is evident that Lewis Carroll has tacitly assumed, what Mr Johnson's treatment of hypotheticals assumes openly, that these propositions are equivalent. But this seems to involve the doctrine that a hypothetical can *never* be what Mr Johnson calls 'modal' (*Mind*, N. S. No. 1. p. 19). How then could it ever be used as major premiss, the essence of which use of a proposition is to assert the *inferribility* of the consequent from the antecedent?

ALFRED SIDGWICK.

Mr Alfred Sidgwick argues that, because a proposition occurring as clause in a hypothetical must be there regarded as possibly false and possibly true, it has in the hypothetical an import *different* from that of the same form of words affirmed or derived categorically. He also points out that in the *modus ponens* or the *modus tollens* the *same* proposition is affirmed or denied categorically, which in the hypothetical premiss is regarded as possibly false and possibly true. Hence, *if Mr Sidgwick's general contention is sound*, a form of words occurring as clause in a hypothetical has a *different*—and at the same time *not* a different—import from that of the same form of words occurring in a categorical. I infer from this that *Mr Sidgwick's general contention is* not *sound.*

When Mr Sidgwick states that the two premisses (i.) 'If A then B' and (ii.) "From the truth of C would follow 'If A then not B'" constitute together a *modus tollens*, he is simply begging the question at issue. Whether or not they constitute a *modus tollens* is to be decided by the answer to the question whether or not 'If A then B' and 'If A then not B' are contradictories. And this question is wholly independent of the fact that the latter occurs as a consequent clause in a hypothetical and therefore is given as possibly false, while the former is given as unconditionally true. For the *import* or *force* of a given form of words is altogether unaffected by its possible falsity. I certainly claim to interpret the given propositions and clauses by reference to their *context*. In short, taking Mr Lewis Carroll's ingenious problem as a whole, it is obvious that my solution is the only solution in accordance with the common-sense view of the matter.

W. E. JOHNSON.

NEWS.

We have received the following notice:—

MM. Beaunis et Binet, directeur et directeur-adjoint du Laboratoire de Psychologie de Paris (Sorbonne), feront paraître en 1895 une *Année psychologique*, contenant les travaux du laboratoire et le résumé des recherches expérimentales de psychologie parues en 1894 dans les pays étrangers. Les psychologues sont priés de leur envoyer des tirages à part de leurs travaux, pour que l'analyse puisse en être faite dans *l'Année*.

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